

WILD FLOWERS AS THEY GROW

Photographed in Colour direct from Nature



BY H. ESSENHIGH CORKE, F.R.P.S.
With descriptive text by
G. CLARKE NUTTALL, B.Sc.

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Wild Flowers as They Grow



BLACKTHORN

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H. Essenhight Corke*

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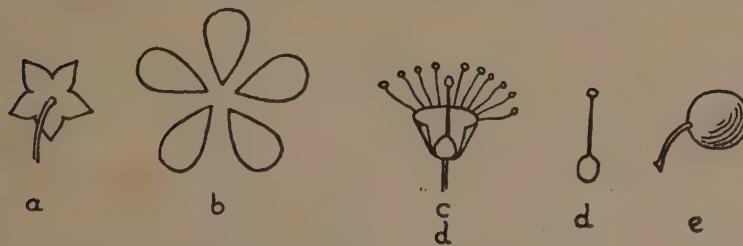
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WILD FLOWERS AS THEY GROW

THE BLACKTHORN

PRUNUS SPINOSA

IN the "black winter" of March days, when the north wind blows its hardest and cruellest, and the snow scurries before it, the Blackthorn



a, sepals. b, petals. c, stamen. d, stigma, style, ovary. e, fruit.

pushes out its round, white, pearl-like buds, for "the Lady of Pearls" seems fearless of, nay, even to revel in, the cold. Undaunted, the buds open, and the black, spiny branches are studded with purest

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white flower-stars. It is amazing that such a glory of delicate blossom can withstand such bleak exposure, for the leaves shrink back from the cold and, as the wind cuts through them, the branches are bare but for the flowers. Midland folk often talk of this cold spell of weather as "the winter of the Blackthorn."

Superstition has thrown a guard round this tree mightier than any amount of wire fencing or any number of notice boards. For tradition, dating from most ancient days, insists that a Blackthorn branch in flower is a "death token" if carried into a house. So, rarely indeed do we find profane hands rifling its beauties, and hardly ever do we discover it tempting fate in mansion or cottage. Peculiarly sacred are the solitary Blackthorn trees that we sometimes find in sheltered spots on moorlands, for these, say the Celts, who, as all the world knows, have special knowledge of such matters, are the fairies' trysting places, and a meeting place for the "little folk" generally, and woe betide him

The Blackthorn

who touches leaf or branch of such a tree. No doubt all these superstitions date from prehistoric days when some form of Nature-worship was practised. It has been suggested that one of its names—Buckthorn—owed its origin to bucks having been sacrificed upon its wood, and to this day in some parts of the Continent the Easter fire is kindled with Blackthorn wood. According to the Swabians, it furnished the material for the true Cross.

The Blackthorn belongs to the family of the rose—the *Rosaceæ*—the family that gives us all our most beautiful native flowering trees. The crab-apple, the wild cherry, the hawthorn and the rowan are all its kin. Its flowers, though small, are after the pattern of the wild rose; though, as is usual in this family, the fruit-bearing part of the flower has its own peculiar characteristics. There are five sepals, five delicate white petals, and a whole multitude—fifteen to twenty—of stamens, which are raised on a little wall round a central chamber,

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the stamens—finely fashioned and small anthered—lightly roofing it over. This chamber must be the paradise of small flies, for the inner surface of its circular wall literally oozes with honey, while other insects, such as the lesser kinds of bees (*Andrena*), do not disdain to lick it also. In the centre of the floor stands a single globular ovary, from whose top a long column rises crowned with a knob-like stigma ; the stigma is about level with the anthers. (In the rose there is a large number of much smaller ovaries, with their accompanying styles and stigmas, filling the chamber.)

Now a Blackthorn flower has a life of about a week, but how precisely it manages its affairs during that time seems to be a matter of question. One observer says that the stamens are mature first ; another is quite certain that the stigmas are ready for fertilisation before the anthers shed their pollen ; a third declares that both are ripe at the same moment. It is difficult to decide priority ; one's own observations tend to give the credit to the

The Blackthorn

stigma, but, anyway, for most of the seven days, the flower is both scattering and receiving pollen, and though the greater number of insects do not choose bitter March days for their visiting, yet the Blackthorn gets all the attention from those that do.

Pollination effected, the flower fades, the various parts drop off, and the ovary is left alone. Its wall swells slowly during the summer months, and turns quite black, so that September sees the place of the starry white flowers taken by the well-known sloes. A purple bloom of wax relieves their inherent blackness, but there is, at this time, no mitigation of the harsh, acrid juice within. The tree, which protects its foliage by sharp spines from browsing animals, defends its fruit by acridity from too early depredations. Each sloe contains a single seed with stony coat. At no time are sloes to everyone's taste, but country children will eat them with a certain amount of pleasure in late autumn days as the acerbity wears off.

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“ Sloes austere,
Hard fare!—but such as boyish appetite
Disdains not.”—COWPER.

Anne Pratt relates that in her youthful days—the beginning of the nineteenth century—she and her friends used to collect sloes in a bottle and bury them deep in the earth till Christmas, “ when they formed a preserve, which to childish taste, at least, was delicious.” Roasted sloes formed even a greater dainty, the cooking being done by holding a sloe branch over a picnic fire of crackling branches. Here is a proper recipe, dating from 1654, for preserving sloes: “ Take very ripe sloes with their stalks, and put thereto two parts of honey and one part of wine, and let them seethe so long until the wine be thoroughly sodden away; afterwards lay the sloes in a pot with the stalks on high, and pour the same honey upon it and cover with a trencher, and lay some heavy thing on them to the end that they may be covered with the liquor, and set them in a cellar.” Sloe gin, made by steeping sloes in

The Blackthorn

gin, is a very favourite homely liqueur even to-day ; its " warming " qualities are proverbial, and so, too, is its danger to a weak head. From sloe gin to port wine was once only a step, and many a bottle of " fine fruity port " has had the sloe for its chief parent. A capital marking ink for linen was made by our grandmothers from the juice of the sloe. Round the sloes, as round the hips and haws, proverbs of prophecy have revolved. " Many sloanes, many groans," says one. " Many sloes, many cold toes," echoes a second. The latter certainly refers to winter prospects, but the first may foretell indigestion quite as truly as coughs, colds and hard times.

Many names of the tree relate to the fruit ; thus it is known in various districts as " Slaa- Slan- Slea- Sloe- Sloan-thorn " ; as " Sluies," " Bulties," and " Winter Picks." Sloe or Slow bush is the plant's Anglo-Saxon name.

Of course, sloes play their part in rural medical matters. A country rhyme runs :—

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“At the end of October go gather up sloes,
Have thou in readiness plenty of those,
And keep them in bedstraw or still on the bough
To stay both the flux of thyself and thy cow.”

To-day we may find in country cottages branches of the fruit gathered in early days and kept hanging for use as emergencies arise.

Once upon a time the roots were also reputed of value, but Culpepper, though he includes them in his “Herbal” (1653), remarks with characteristic honesty: “Of Sloe bush, or Sloe tree, I think the college set this amongst the roots only for fashion sake, and I did it because they did.”

The leaves of the Blackthorn are oval, smooth on top, downy beneath, edges toothed and with a short stalk. At one time, when tea was much dearer than it is now, a good deal of the “tea” that was sold was really only the tender leaves of this plant carefully dried and coloured. The colouring matter was injurious to the drinker, and at the beginning of the nineteenth century vigorous steps were taken

The Blackthorn

to detect the adulteration and punish the perpetrators thereof.

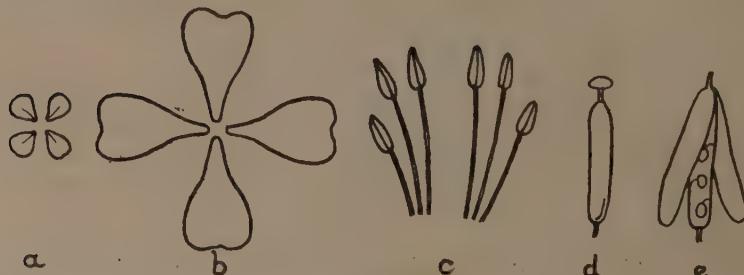
The Blackthorn may be a small tree, but it is usually a thickly branching shrub with a black bark. The branches end in a spine instead of a bud, and these spines are a great guard to the young leaves. Pricks from them are apt to cause festering, as if some sort of poison lodged in them, and there are a number of ancient charms and incantations which were supposed to ward off this injury if they were said at once. The famous Irish "shillelagh" is made from the wood of the Blackthorn.

The Wild Plum and the Bullace are varieties of the Blackthorn, having rather larger fruit, and less thorny branches, and being somewhat taller. From them have been derived, through many ages of cultivation, the damson and the other plums that we eat to-day. The apricot, the almond, the peach and the nectarine, as well as the Portugal laurel of our gardens, all belong to the same group as the Blackthorn.

THE LADY'S SMOCK

CARDAMINE PRATENSIS

LADY'S SMOCK, or Cuckoo Flower, "flowering for the most parte in Aprille and Maie when the Cockewe doth begin to sing his pleasant notes without stammering," is one of our best known



a, sepals. *b*, petals. *c*, stamens. *d*, stigma, style, ovary. *e*, fruit and seeds.

English wild flowers. Its gleaming tones, lighting up the meadows, especially those by the brookside, are part of the sign manual by which Nature testifies to that joyous return of spring :



LADY'S SMOCK

The Lady's Smock

“ When daisies pied and violets blue,
And lady-smocks all silver white,
And cuckoo-buds of yellow hue
Do paint the meadows with delight.”

The old Church Calendar of the flowers speaks of “our Lady's Smock at Our Lady's tide,” but our present Lady-day is a little too early for it generally, and we must remember that under the old calendar March 25 represented a date eleven days later in the season. The “smock” of its name is supposed to be due to the resemblance that the white patches of these flowers in the grass bear to white linen smocks spread out to dry and bleach. Gerard tells us that this was the homely name of the plant at “the Namptwich in Cheshire,” and, as that was his native country, he set his seal upon it as the typical English name for the plant in his “Herball.” Variations of its “cuckoo” name are to be found, such as “Cuckoo Bread,” “Cuckoo's Shoes and Stockings,” and “Cuckoo Spit,” the last because of the frothy saliva-like masses which the grasshopper deposits on

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its stalks. Other country names for the flower are "Milkmaids" (perhaps because both maiden and flower affect pale purple for their colour), "Bread and Milk," "Bird-Eye," "Apple Pie," "Bog Pink," "Meadow Cress," and "Bitter Cress." The last two specially refer to the leaves, for these are cut up into a number of leaflets, say from nine to thirty-five, one terminal, the rest arranged in pairs, and their sap is piquant, almost biting, so that villagers sometimes eat them as cress. In olden days they were often put into salads. In the lower leaves of the plant it will be noticed that the leaflets are more or less oval, in the upper leaves they are much narrower; indeed, the foliage, as a whole, is distinctly pleasing. If the leaves lie on the damp earth they possess the power of forming roots from their epidermal cells, or from the cells beneath their epidermis, and these roots will give rise to new plants. It is only however where the leaves actually *touch* the earth that this power is awakened, a power shared by the leaves of the begonia and the pepper plant. It is

The Lady's Smock

very curious to see the Lilliputian plants with their tiny leaves and roots forming on the Gulliver of a leaf. Their Lilliputian flowers are often doubled, and look like tiny rosettes.

Now, when we turn to the flowers we see at a glance that the Lady's Smock is a close relative of the wallflower, both being of the "cross" type and members of the *Cruciferæ* family. In fact, these two plants may be said to be the showy members of the family so far as our wild flowers go, but since the wallflower is not a genuine Britisher, but only a naturalised alien, the palm for beauty among our native crucifers goes to the Lady's Smock of our sketch. The ground plan of all the crucifers is after precisely the same pattern—four sepals set crosswise, four petals set crosswise between the sepals, six stamens, and two carpels joined together and eventually maturing into the fruit, which forms a kind of pod, usually with a division lengthwise. But the whole family is often divided into two great groups, one in which the pod when ripe splits and

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drops out its seeds, as in the case of the wallflower and Lady's Smock, the other where the seeds are divided by partitions, and where the pod does not split, as is the case in the wild radish. There are far more crucifers in the first division than in the second.

Now, when we look at the sepals we can see that they bulge a little at the base to form shallow pouches, two of these being larger than the other two, and these serve a special purpose, as we shall see. The delicate purple petals are veined with a deeper purple, but they bleach somewhat as they lie open to the sun. When we look at individual flowers it is curious how their tones are distinctly lilac or sometimes pink, but when we look at them in a mass silvery-white is undoubtedly the term that we should apply to them. The six stamens were, no doubt, originally only four, but two opposite ones have duplicated and lengthened in the course of ages, so that we have now, one short stamen, a longer pair, one short stamen, a longer pair, forming

The Lady's Smock

their ring. At the base of each of the original four was a nectary, and there has been no duplicating here, so there still remain four—one at the base of each single stamen and one at the base of each pair. It is rather strange that the nectaries at the base of the single stamen are larger than the other pair. And now we see the use of the special sepal pouches, for while honey is manufactured in the nectaries it is stored in the pouches, and since two of the manufactories are larger than the other two, it follows that their storehouses must be larger also. (It is noteworthy that while the flowers of this family are remarkably uniform in plan, yet almost every species differs in the number of the nectaries and their position in the flower.) The pod-like ovary has a very short style carrying a thick, rounded stigma, whose flat top is on a level with the longer stamens, and it is ready to receive pollen the moment the buds open. Kerner says that in all the crucifers the stigma is mature at this time, but that the stamens have their pollen boxes closed

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until a little later so that cross-fertilisation is generally effected. Lord Avebury, however, believes that, as a rule, stamens and stigmas mature together in this family. When the anthers of the long stamens open they turn slightly away from the stigma as if to prevent their pollen falling on it, but the anthers of the short stamens, which are below it, frankly open directly into the middle of the flower. In any case this particular plant seems quite immune to fertilisation by its own pollen.

In the bright spring sunshine all sorts of insects flutter round the dainty Lady's Smock, and pay it by no means disinterested visits. Bees of various kinds, flies of all sorts, and beetles drink from the sepal-troughs, while butterflies and moths also probe the "faint sweet cuckoo flowers" for honey. Doubtless its gleaming whiteness makes a special appeal in the dusk to the moths.

When the fruit is ripe and dry it splits open suddenly from base to tip, the valves roll backwards, and the little seeds are slung out and scattered.

The Lady's Smock

In olden days the flowers used to be dried and powdered, and then given as a cure for epilepsy, and for a long time they had a considerable medicinal reputation ; indeed, in 1767, a certain Sir George Baker read before the College of Physicians a paper dealing wholly with the value of this plant in medicine. He explained that the flowers must be prepared “ by toasting in pewter dishes,” and then the powder boiled in bottles covered with leather, and “ on no account with cork.” Some say its botanical name *Cardamine* has a Greek derivative, meaning heart-strengthening ; others, however, assert that it is from the Greek for watercress.

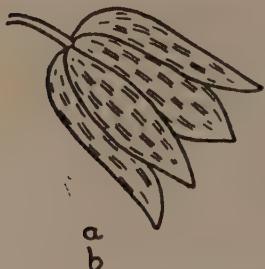
The Lady's Smock is one of the plants that have emigrated from Europe to North America, and now it is naturalised from coast to coast north of New Jersey. Happily it is more welcome than are some of the wild flowers we have sent over there—thistles, for instance.

This herb grows about a foot in height, and has a perennial root.

THE FRITILLARY

FRITILLARIA MELEAGRIS

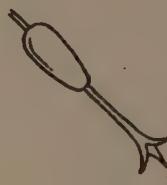
ONCE seen, never forgotten, the vivid personality of the Fritillary haunts the memory. Only in some rare localities and for a few spring days in every year does one realise its



a b, perianth of floral leaves.



c



d

presence; only when it rears its striking buds and flowers from the grass of some damp meadow, or in some unfrequented woody nook is it noticeable, but its existence is better known to flower-lovers



FRITILLARY

The Fritillary

than many a commoner plant. "Strange and beautiful Snake's Head Fritillary. She is a sort of Lamia among flowers, lurking in out-of-the-way places, her stem unfolding a couple of javelin leaves. The pale bud, like a serpent's head, bends acutely on the ivory stalk, and as it unfolds, displays deepening spots and markings of purple and black that are the pattern of the adder's skin."*

A tiny bulb—it has been compared to a good-size black currant—two or three leaves, and rarely more than a single flower comprise the Fritillary; little enough to create so great an impression. At the outset of spring the bulb consists of two fleshy scales with, perhaps, a case formed of two decaying scales. Later there arise within two very minute scales. As the days pass the outer fleshy scales give up their store to build the flower, and become empty, worthless and shrivelled; but meanwhile the leaves are pouring down nutriment into the tiny inner scales so that they grow and swell and form the

* Anna Lea Merritt.

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bulb for the ensuing season. Sometimes, however, the bulb gives rise to a bud, and this forms a new bulb alongside, which again may divide, and thus the plant is propagated. The leaves are very long and narrow and alternate on the stem, and are little to be remarked as they grow among the grass. It is to the flower alone, both in bud and in mature bloom, that the plant owes its power to arrest attention.

When the flower-stalk emerges it has its bud bent right over and lying head downwards close beside it. As the bud enlarges and moves a little space away, it is remarkably like a snake's head, and hence a common name of the flower—"Snake's Head." Still drooping, it opens and shows its petals chequered with colour in a very singular way; red, black, purple, the colour is produced in such quaint squares and blotches "that every leafe seemeth to be the feather of a ginny hen whereof it tooke its name." And to-day, as in Gerard's day, "Guinea Hen Flower" is a local name for

The Fritillary

the plant, diversified at times according to fancy into "Turkey Hen Flower," or "Pheasant Lily." The botanical specific name *Meleagris* is also from a Greek term applied to a guinea hen. The generic name, *Fritillaria*, is from the Latin *fritillus*, a dice-box, because, say some, the chequered appearance is like a dice-board; others, however, say that the shape of the flower suggests the dice-box. Probably a confusion of the two ideas is responsible for it. "Chequered Lily" and "Chequered Daffodil" are also old names of the plant. Two further names have come down to us with an uncanny suggestion about them. In parts of Devonshire it is known as "Leopard's Lily" and "Lazarus Bell," and it is usually thought that its spottedness accounts for the first of these two terms. It is, however, more than probable that both have a common origin, and are corruptions of "Leper's Lily" and "Lazar's Bell" respectively, and date back to those days of the Middle Ages when leprosy was a well-known sight, and a lepers'

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hospital stood outside every town. Its scaly markings would suggest it as the "Leper's Lily" and, together with the shape of its flower, would further be reminiscent of the warning bell that the lazari, or leper, carried. From the plant's point of view the colouring is probably protective, and it is wonderful how it seems to efface the flowers when they are growing among stones.

Though the flowers look bell-like, yet the petals are only overlapping and not joined together in any way. (Notice there is no distinction between sepals and petals, and the bell is technically a perianth). At the bases of the three inner petals—that is, right at the top of the bell—are honey glands. We have it on Mrs. Louden's authority that, in some parts of the country, the plant is known as the "Widow's Flower," because these glands at times overflow and "tears" stand in them. In the centre of the bell six stamens hang suspended from the bases of the petals; their anthers are not set absolutely end-on to the filaments, the attachment

The Fritillary

being a little way up the median line. At the top of the bell within the ring of stamens is the ovary, oblong and three-celled, its style and trifid stigma hanging like a clapper. When the bud opens the stigma is quite prepared to receive pollen, but the stamens have, as yet, their pollen-boxes closed.

Now the Fritillary is essentially a bee flower; flies, beetles and such-like insects that require a flat settling place before they can lick up the honey are all barred from it, but bees of all sorts, hive or wild, can fly under the bell and clamber up to the honey by the aid of the stamens and the style-clapper. At the beginning of the five days during which this flower remains open the bees' dusty abdomens will coat the ready waiting stigma with pollen that the insects have brought with them; later, when the anthers open, their abdomens will obtain a fresh supply to be carried to adjacent plants. These bell-shaped flowers are peculiarly well adapted to keep their pollen safe and dry during the several days the flower invites guests. No doubt during

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the last part of the period pollen from its own anthers will be transferred to its own stigma to fertilise its own seeds. If they have already been fertilised there are no ill-effects from the double dose.

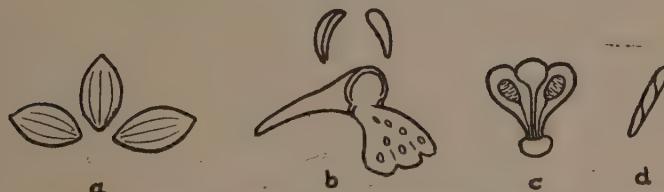
The fruit is a capsule containing several seeds in each of its three cells.

The Fritillary belongs to the lily family—*Liliaceæ*—but it is the only representative of its genus—*Fritillaria*—in England. There is an old tradition that it followed in the wake of the Romans when they occupied Britain, but anyway it never seems to appear farther north than Norfolk nor farther west than Somerset. Oxfordshire is a well-known hunting ground for it. Gerard tells us in the sixteenth century that “These pleasant floures are greatly esteemed for the beautifying of our gardens and the bosoms of the beautiful,” and to-day in the twentieth century they are still “greatly esteemed for the beautifying of our gardens,” but “the bosoms of the beautiful” now prefer other blossoms.

THE SPOTTED ORCHIS

ORCHIS MACULATA

AT its best the Spotted Orchis is perhaps the handsomest of our British orchids. It is true that it varies a good deal both in size and in richness of colouring, but, in a soil that exactly suits it, it has been known to be over three feet in



a, sepals. *b*, petals. *c*, stamen with pollinia and rostellum. *d*, ovary.

height and proportionately fine. The leaves on each plant differ somewhat in contour and in size also, the lower ones being more oval, and the upper ones narrower and longer, but all are a pretty

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pale-green colour, and often there is a silvery sheen upon them. Their striking characteristic, however—a somewhat disfiguring one—lies in the blotches of reddish-brown that are so plentifully scattered over their upper surface. It almost seems as though Nature, when she had finished colouring the flowers, in a fit of playfulness gave a final whisk with a full brush over their greenness. Just occasionally these spots are not to be found, so variable is the plant, but their prevalence has given it its name. In some districts as many as a third of the leaves may be without spots, but no scientific explanation either of their presence or of their absence has yet been given, although environment, altitude of growth, and the kind of soil have all been investigated with regard to it. Undoubtedly the plant is rendered more conspicuous by the spots.

The flowers are any hue from a pale pink to a rich purple, and they are very effectively massed together in spikes, with the oldest flowers lowest. They are very similar in structure to the early purple



SPOTTED ORCHIS

The Spotted Orchis

orchis and the pyramid orchis that have already been fully described in Vols. II. and III. There are three sepals, coloured like the petals, and three petals, two of which are small and the other large with three irregular lobes. This large one is known as the labellum, and by rights it should be at the top of the flower instead of at the bottom, but Nature has given the flower a big twist—it can be plainly seen in the ovary—and so the labellum has come to be below instead of above. It has spots upon it of a darker colour than the rest of the flower, and these mark it out as a conspicuous platform for insects to alight upon. But it has another feature—a slender spur—which runs back at the centre of the flower, and which looks as if it contained honey. Honey, however is not there in the way we usually find it in nectaries, but sweet and luscious juices lie in its walls, not open to everyone, but quite accessible to those who bore into the tissues.

The centre of the flower is like nothing else but its fellow orchids. No other kinds of flowers in the

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whole plant world can show such a curious fusion of parts. Only one stamen is developed (though probably once there were three), and the filament of that one has become united during the course of ages with the ovary column forming "the rostellum." But the one stamen has a big head—it rather reminds one of a misshapen dwarf—with the usual two chambers, and in each chamber is a mass of pollen, not floury and loose as is usual, but with the grains all joined together by elastic strands. Each mass is called a pollinium. Now the pollinia stand upright, each on a sticky disk in its chamber till an insect alights on the labellum and pushes its way towards the spur. Then its proboscis touches the sticky disks, and immediately they adhere, and when it has finished sucking out sweet juice from the spur-wall and withdraws, the pollinia are carried away upright on the proboscis. But not long do they ride erect. Within a few seconds they fall forward and lie in such a position that they will strike directly on the sticky surface of the united three

The Spotted Orchis

stigmas of the next flower visited and be transferred in turn to it.

As to the insects which frequent this orchid, the larger two-winged flies are the chief. Darwin says that his son "saw many specimens of a fly (*Empis livadi*) inserting their proboscides into the nectary. He brought home six specimens of this *Empis* with pollinia attached to their spherical eyes, on a level with the bases of the antennæ. The pollinia had undergone the movement of depression, and stood a little above and parallel to the proboscis; hence they were in a position excellently adapted to strike the stigma. Six pollinia were thus attached to one specimen and three to another." Moths, too, frequent it, while yet another observer reports finding a longicorn beetle with a tuft of these pollen masses attached to the front of its mouth, and occasionally a humble bee may be seen trying to rub off with its forelegs these inconvenient acquisitions. Sometimes, however, the wrong sort of visitors make their

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appearance, with results disastrous both to the flower and to themselves. Mr. Step tells us that on one occasion he saw that a very large number of the flowers of *O. maculata* had been visited by small flies that had crept right into the spur, but had been unable to extricate themselves again. On many spikes examined nearly every flower was thus to all appearance rendered useless. He opines that "this appears to be a serious matter for the plant," and we may add for the insect, too, as it meets its death for its temerity.

However, our Spotted Orchis does not appear to suffer, as a rule, from lack of seed. Darwin calculated that a single flower produced 6,200 seeds in its twisted ovary—needless to say the seeds are very minute—and that since there may be thirty fruit capsules on a single plant, the total number of seeds for which it would be responsible would be the magnificent amount of 186,000. And then he went on to a curious calculation in order to show the possibilities this increase involved. He pointed

The Spotted Orchis

out that an acre of land would hold 174,240 growing plants; hence, allowing for a few bad seeds, the progeny of a single plant in a single year would cover an acre. "At the same rate of increase, the grandchildren would cover a space slightly exceeding the island of Anglesea; and the great grandchildren of a single plant would nearly (in the ratio of 47 to 50) clothe with one uniform green carpet the entire surface of the land throughout the globe." Something must effectually limit this prodigious multiplication, since orchids are rare rather than overwhelming in numbers, and the check is that it takes a seed seven years to develop into a flowering plant, and during those seven years how many a vicissitude may come to cut short its career! So very different is it to many of our ordinary wild plants, which germinate, flourish and produce seed all within the cycle of a summer season.

Now all the members of the *orchis* genus of the orchid family have two tubers formed from the rootstock, one tuber serving to supply the imme-

Wild Flowers as They Grow

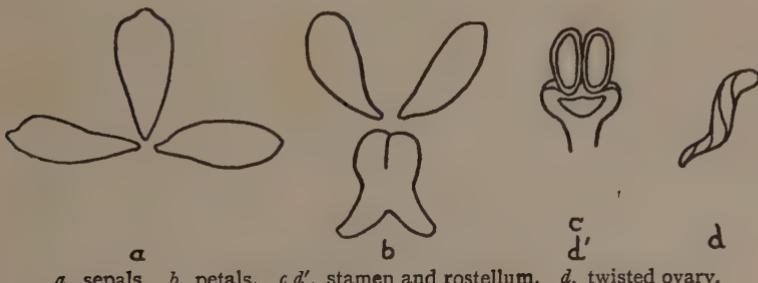
diate necessities of the plant, the other receiving the leaves' surplus supplies to store for future use. In this particular orchid these tubers are divided into two or three finger-like lobes, and hence the plant has been known as *Palma Christi*. Gerard calls it by the quaint name of "The Female Satyrian." (Orchids were then known as "Satyrions," because they were supposed to be the unholy plants of the Satyrs.) Nowadays it is still sometimes spoken of as the "Spotted Palmate Orchid." These tubers formerly were used to prepare the nutritious "Salep." It is a plant of the lowlands, loving sheltered woods and copses and moist fields.

THE BIRD'S NEST ORCHIS

NEOTTIA NIDUS-AVIS

“OH, what a fall was there, my countrymen!”

The quotation comes aptly to our lips as we turn from the spotted orchis of the last chapter to the Bird's Nest Orchis of the present one. The



a, sepals. *b*, petals. *c d'*, stamen and rostellum. *d*, twisted ovary.

two plants stand side by side, the closest of relatives—both members of the same family—and an unmistakable family likeness testifies to the fact, but in spite of it, one plant is desirable and attrac-

Wild Flowers as They Grow

tive, an adjunct of beauty to our flora, while the other is drab and repellent, interesting only as a travesty of what might have been. The first carries itself in proud bravery, with spikes of bright pink flowers set off by glistening, brilliant leaves; the second is a monochrome of dreary brownness, its dead-looking clusters of flowers being accompanied only by small, still more dead-looking scales. The contrast is most marked and points a notable moral, as we shall see.

The home of the Bird's Nest Orchis is the woods—beech or pine woods for choice—and there, rising out of the mass of decaying leaves in every stage of decomposition one may find, if one is lucky, the thick, fleshy, pale-brown spikes. We say “if one is lucky” advisedly, for this orchis is the “vanishing lady” of the plant world, and because it may be found at one time in a certain place, that is no reason why it should be found there again when one next goes to look, or even if one looks a number of times. And yet, perhaps, long after, by chance, it



BIRD'S NEST ORCHIS

The Bird's Nest Orchis

may once more be found flourishing at the very spot, and then again it disappears mysteriously. Once its vagaries were felt to be inexplicable, but now the whole matter is cleared up, and part of the explanation lies with that wonderful root it possesses. Now the root of the Bird's Nest Orchis is one of its chief features, and it consists of many rootlets which, "issuing from the subterranean part of the stem and imbedded in humus, remind one in form and colour of earth worms, and together constitute a strange tangled mass as large as a fist." This mass is supposed to be very like a bird's nest—Gerard thought it resembled a crow's nest made of sticks—hence the common name of the plant. The rootlets possess the rather rare power of being able to form buds at their tip, which buds can give rise to new plants, the power especially coming into play when the main rootstock dies. But infant plants of the Bird's Nest Orchis are very slow in their growth, and they have to be quite five years old before they are in a position

Wild Flowers as They Grow

to throw up above ground their flower-spike—shoddy looking as it is; and all this preparatory time they are lying hidden under a mass of decaying leaves, and giving no hint at the surface of their presence below. Hence the mysterious vanishings. And when the flower-spike does at length appear it is only the sign of the fag end of that plant's life. For a few spring days it will flourish and be very attractive to insect life around, but then the flowers wither, and though the spike, bearing maturing seeds, lingers on for a time, it eventually dies and disappears. The cycle of life is complete for that individual, and for five years there will be no hint of successors, though a few buds at the extreme ends of the rootlets will be preparing them. Years below ground, months above, that spells the life story of the Bird's Nest Orchis.

Let us next examine in detail this curious flower-spike as it rises from the "bird's nest" root. It is nine inches to a foot in height; the lower third, thick and succulent, is sheathed by a few brown

The Bird's Nest Orchis

scales, which are all that there is to represent the vivid leaves that are the possession of the spotted orchis. Above the leaves are first a few odd flowers, then a dense spike of them, terminating in buds. Each flower has three sepals and three petals; the lower petal—the lip—is large and two-lobed, and honey exudes in a groove down its centre. The middle of the flower is more or less a single mass which, behind, represents the one stamen with its two pollinia and, in front, the united three stigmas. The stigmas form a curious overarching organ, known as the rostellum, large, thin and with bulging face; and below it is a receptive surface.

In this orchid the rostellum is of very special interest, for it is of an explosive nature. It is divided into spaces which contain a sticky substance, and its surface is exquisitely sensitive, particularly at six rough points which can be detected on it. So, directly it is touched, however lightly, it suddenly expels a large drop of this sticky substance which promptly sets hard in the

Wild Flowers as They Grow

air. Now, when the flower is only a bud, the two pollen boxes open, and the pollinia fall out and lie just touching the top of the rostellum; hence, directly the bud opens, they are ready for removal. Insects come in numbers—beetles and flies in particular—to lick up the honey, and they creep along the sweet channel until they come to the end, right under the overarching rostellum. There each visitor raises its head and inevitably touches the sensitive surface. Out shoots a drop of white cement, the ends of the pollinia dip in it, and in a moment they are glued to the insect's head. The rostellum, after the explosion, curls downwards and covers over the stigma so that the plant's own pollen does not fall on it. The insect flies to the next flower, perhaps collecting there another pair of pollinia; and so on, until eventually it comes to an older flower where the pollinia have already been removed, and where the rostellum is no longer irritable and explosive. The stigma is now unguarded, and the visitor deposits on it some of the pollen from its

The Bird's Nest Orchis

head, for the pollinia are very friable and soon break up. If, perchance, large insects do not visit the flower and the pollinia lie waiting in vain for the stimulus of the explosion that should send them on their travels, then they begin to swell and break up so that their grains may either fall on the stigmatic surface or be rubbed on to it by small creeping insects, such as thrips, which never fail. Thus this orchid may be either cross or self-fertilised.

The fruit is a capsule containing many very small seeds. It is not very clear whether these seeds germinate easily; certainly all attempts to cultivate the plant have been in vain. Its structure and methods of action are almost identical with those of the more familiar tway-blade orchid of our pastures and woods, and both are among the more remarkable members of the orchid family. For further details the flower-lover should read Charles Darwin's book on "Orchids."

As to the nature of this plant, it is obvious, at a glance, that it is a degenerate. At one time

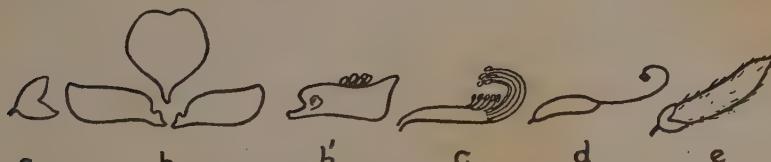
Wild Flowers as They Grow

it was commonly believed to be a parasite preying upon other plants. But this is a slur upon it; not to such depths has it yet fallen, as can be proved by digging it up and washing its rootlets free, when it is clear they are not attached to any other rootlets. Nevertheless, it is not a free and independent member of the plant world, and it has lost the power to be such. Instead of building up its own tissues from sweet air, fresh water, and the simple salts of the earth, as all self-respecting plants do, it feeds upon the decaying remains of other plants, i.e. it is a saprophyte. It picks out what it wants from foodstuffs lying in dead leaves and stems, and so saves the trouble of manufacturing them, but it has paid dearly for the ease it has obtained. It has lost its leaves—they were not used as manufactories; it has lost its colour, since green colouring matter is the chief agent in the manufacturing process, and it had no use for it; and with this double loss it has lost its attractiveness, and become, in Gerard's words, "a bastard and unkindly Satyrium."

THE BROOM

SAROTHAMNUS SCOPARIUS

NONE of our British wild plants is more whole-hearted in its flowering than is the "bonnie Broom." In early summer days it suddenly throws itself with such fervent intensity into



a, sepals. *b*, petals—standard and wings. *b'*, keel of petals. *c*, stamens. *d*, ovary, style, stigma. *e*, fruit.

blossoming that its switch-like stems become "yellow and bright as bullion unalloyed"—rods of pure gold, which form patches of brilliance on rocky hillside and sandy heath.

Wild Flowers as They Grow

“The broom,
Full flowered and visible on every steep,
Along the copses runs in veins of gold,”

says Wordsworth.

This picture Kerner endorses when he describes the Broom completely covering rocky desert islands off the coast of Istria. “In May large golden flowers, scented like acacias, appear on the green rods of the Broom, and then for a short time the dark green of the switch-plant is changed into a brilliant yellow. On passing near the coast just at this time, the remarkable phenomena is seen of golden-yellow islands rising above the dark blue sea.” But he presents the other side of the picture when he adds: “This floral adornment is, however, but transitory, and nothing more monotonous and desolate than such a dry, unwatered islet covered with these shrubs can be imagined.” Still, once every year the Broom is unsurpassable, and no one who has stood on one of the Broom-covered heaths of Finisterre on some bright May morning can ever



BROOM

The Broom

forget the riot of colour and scent that enveloped him that day.

The sense of crowded opulence is accentuated because the green leaves play such an insignificant part on the branches, for the Broom is one of the so-called "switch-plants," and, in these, green tissue is developed on the thin, rod-like stems at the expense of the leaves. The leaves themselves consist of three minute leaflets lying, stalkless, close upon the stem on the upper part of the twigs; lower down we find they have short stalks, and they represent a quite insufficient amount of green tissue to carry on the necessary work of the shrub. But under the microscope we discover that in the stem this deficiency is made good by the presence of green tissue which connects the epidermis with the channels in the centre up which foodstuffs are carried. In furrows along the stem, too, stomata, or little organs which regulate the water supply of the plant, are to be found, these organs being usually only present on green leaves. Therefore,

Wild Flowers as They Grow

we have the stem as co-worker with the leaves in building up the plant's tissues, and supplementing their deficiencies.

The flower of the Broom is not only sweet and beautiful, it is also interesting, and fulfils its purpose by means of a miniature explosion. A member of the *Leguminosæ* family, it is of the usual butterfly shape, with a large upstanding "standard" petal, two smaller "wing" petals having a blunt tooth at their base, and two petals which together form the "keel" of the flower, and which have a swelling and corresponding tooth to interlock with the wings ; they are also attached to the rest of the flower by a mere apology for a claw. Now, when the bud opens, the interlocked keel and wings are in a horizontal position, the interlocking teeth being just below the standard, and the two keel petals, too, have their upper edges cohering. Inside the keel are lying ten stamens, five long with heads well up to the end of the keel, and five much shorter. All their filaments are joined together into a tube,

The Broom

within which lies the miniature pod and its long, curving column. There is no honey; still all sorts of bees visit it—the humble, hive, and the solitary wild bee called *Eucera*. They alone of the insect world can call the explosion into action, and what happens is this:—

The bee alights on the opening bud and presses its head under the standard; its legs push on the keel and wings. The force of the push of an insect of this size is sufficient to break open the upper edge of the keel, and out pop, half-way along it, the five heads of the shorter stamens. They are open and their pollen exposed, so this is rubbed on to the abdomen of the visitor. If, however, the bud is almost in the full flower stage the strong pressure of the bee causes the keel to split as far as its point against which the style, like a spring, is pushing. It opens suddenly and the stigma is freed and springs up sharply, curling round to touch the bee's back. Up spring, too, the long stamens, and out flies the pollen like a fountain, sprinkling the bee;

Wild Flowers as They Grow

but the stigma touched it first and was smeared with the pollen brought on the insect's back from another flower before its own pollen arrived there. The explosion causes the interlocking between keel and wings to give way, and henceforth the keel hangs limply and the flower gapes; its great effort has been made. It has given its stigma the chance of being fertilised by the pollen from another flower, and it has itself dispatched a load of pollen dust to benefit its neighbours. No longer is it a locked chamber; any insect now may rifle it of what remains—and many do so. The bees alone condescend no more to approach; they have no interest in an exploded flower! (The explosion will act if the flower is pressed by the finger instead of by a bee, and thus can be carefully watched.)

The flower withers and by degrees a black pod takes its place. If the flower is explosive in its methods, the pod is a hundredfold more so. The writer, sitting in the shade one hot July day, heard a succession of sharp, mysterious noises as though

The Broom

something were cracking nuts or sharply pecking. Curiosity demanded an explanation even in the heat, but again and again search for the cause was unavailing. Suddenly an opportune crack at one's very side revealed an unsuspected Broom shrub round the corner busily engaged, under the persuasive influence of the noonday sun, in exploding its dry pods and flinging out its seeds. Each explosion is marked by a sharp "crack," and is very characteristic of the plant.

Two other botanical names have been given to the Broom—*Cytisus scoparius*, and *Genista scoparius*. In the last name we recognise the "*Planta genista*," which gave their name to the Plantagenets. Tradition has it that Gefroi, Duke of Anjou, father of our Henry II., saw by a pathway a Broom shrub, clinging with firm grasp to the rocks, and upholding the crumbling soil. He gathered a spray. "And thus," said he, "shall that golden flower ever be my cognisance, rooted firmly amid rocks and yet upholding that which is ready to fall. I will bear

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it on my crest, amid battlefields if need be, at tournaments, and when dispensing justice." Another tradition says that it was Fulke, the father of Gefroi, who took the plant as his crest as a badge of humility on leaving the Holy Land.

The "Order of the Broom" was founded in 1234 by St. Louis IX. of France, to celebrate the coronation of his queen. It consisted of a body-guard of a hundred nobles, called "Soldiers of the Broom," and bore as its motto, "He exalteth the humble."

All sorts of superstitions have centred round the plant. "Sweep the house with the Broom in May, and you sweep the luck of the house away," says one. Sometimes it is put in a more gruesome form : "And you'll sweep the head of the house away." This alludes, of course, to the custom of making besoms or "brooms" out of the switch branches. Another says that it was the cracking of its pods that revealed Judas's treachery to our Lord. It was generally considered to have something evil

The Broom

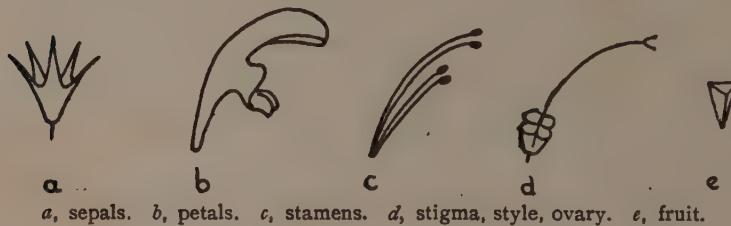
about it—why, it is impossible to say—and witches were supposed to love it and ride gaily through the skies on besoms made of it. A bitter principle runs through its tissues, and hence Broom tops were used to flavour beer before hops were introduced, and the branches were employed to tan leather. Since inherent disagreeableness may keep enemies at bay quite as effectually as definite material weapons, this bitter sap is its method of defence, where the gorse, its brother, produces actual sharp spines. And for effectuality there seems nothing to choose between the methods; both plants defy all manner of browsing animals.

As a medicine, a decoction of Broom tops still retains a place in our *materia medica*, especially in the treatment of dropsy. When fresh, the Broom tops have a peculiar odour which disappears as they dry. An oil called *Sparteia* is distilled from them, which causes paralysis, and in larger doses kills by affecting the activity of the respiratory centre in the brain.

THE RED DEAD NETTLE

LAMIUM PURPUREUM

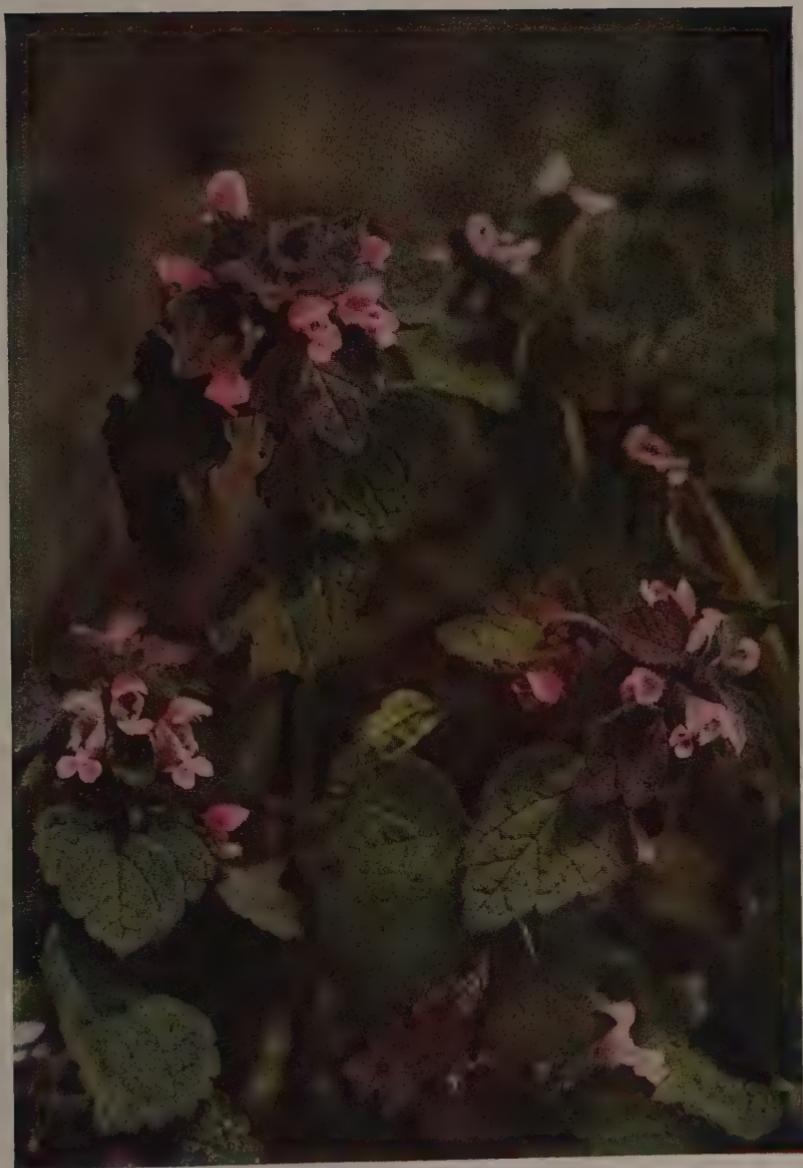
A DULL-LOOKING weed, perhaps, but of infinite interest; lacking, no doubt, in beauty, but rich in skilful plans, the Red Dead Nettle challenges us to ignore it at our loss. High and low



a, sepals. *b*, petals. *c*, stamens. *d*, stigma, style, ovary. *e*, fruit.

—hedgeside, waste place, garden (an unbidden guest there !)—it is common everywhere, all over Britain; only the middle of the street, as an old herbalist remarked, seems free from its possible intrusion.

Its rough square stems, hollow within and a



RED DEAD NETTLE

The Red Dead Nettle

foot or so high, carry upon them a succession of pairs of rough leaves, alternate pairs rising from alternate sides of the stem, so that each pair is at right angles to the pair above and below it. The leaves themselves are heart-shaped, with notched margins, coarse in texture, and with strongly marked veins radiating from the point of their attachment to the stalk. That all the leaves are stalked—even the youngest clustering at the tips—is a point to be noticed, as it is chief guide in helping us to distinguish between the subject of our sketch and its brother the henbit, also a red dead nettle of our countryside. For there are no fewer than five dead nettles growing wild in our land: the white dead nettle with white flowers; the yellow dead nettle with yellow flowers; the henbit, red dead nettle, and spotted dead nettle with red-purple flowers. The white, yellow, and spotted dead nettles come up year after year; the other two are annuals, and require to be renewed from seed every spring.

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Formerly this group of plants—members of the family *Labiatae*—bore the curious name of “Archangel,” and were popularly spoken of as “White,” “Yellow,” or “Red Archangel” respectively. The reason for this is not very plain. Dr. Culpepper, who never could resist snarling at his fellow-practitioners, wrote, about 1580: “To put a gloss upon their practice, the physicians call an herb (which country people vulgarly know by the name of Dead Nettle) Archangel; whether they savour more of superstition or folly I leave to the judicious reader.” But Gerard, who wrote his “Grete Herball” some fifty years earlier, gives “Archangell” as the premier name, and adds, “or Dead Nettle.” Our Red Dead Nettle he calls simply “Red Archangel.” A happier suggestion than Culpepper’s is that the name dates from the days when the saints’ days were known and observed throughout the country, and that the plant’s date of flowering was associated with the day, May 8th, when the Archangel Michael was held in remembrance. Under

The Red Dead Nettle

in the old calendar this date was equivalent to our April 26th.

But to return to the leaf-stalks, whence we digressed. We find that just where they join the main stem they flatten out and form, as it were, a cradle for a bunch of some five or six buds and flowers that spring from the stem close above. Thus for each pair of leaves—at any rate the upper ones—two bunches of flowers arise opposite to each other. At first the buds are like so many little pink pin-cushions, set in tiny green cups, edged with five long spikes; but presently the pink portion pushes outwards from the calyx, and by degrees the familiar gaping flower is evolved. Its lines may not be of the loveliest, but we soon discover that, like a well-constructed house, it is a model of adaptability to its purpose. The diagram at the head of this chapter shows that the corolla is in the form of a short, irregularly shaped tube, which expands into an overarching roof and a broad lip. Two lateral walls flank the top of the tube. At the ends of these

Wild Flowers as They Grow

are minute teeth, which are all that now remain of two petals that were once present, but were found useless for the plant's schemes, and hence eliminated. Inside, two pairs of stamens lie; they are joined to the corolla midway up, and their filaments run along under the overarching roof, closely following its lines. The anthers of one pair are just at the extreme tip of the roof; the other pair are a little behind. Sometimes it is the outer pair of filaments that are the longer, sometimes the inner. Here again the plant has got rid of a superfluous member, for once upon a time there were five stamens as well as five petals. The rudiments of this stamen can occasionally still be found. Between the pairs of anthers is a forked tip, the head of another column, which we find runs right back to the very bottom of the corolla tube, and ends there between four little parts—the nutlets-to-be. Round these honey is produced and collects in the tube. A rim of hairs forms a shield and a delicate cover to it.

The Red Dead Nettle

Let us next consider the meaning of these arrangements. Now the dead nettles as a class are bee flowers; indeed, a common name for them is "Bee Nettles." The white dead nettle, with its large flowers, only caters for the bigger kinds of bees; but the smaller flowers of the Red Dead Nettle cater for those lesser bees whose probosces are too short to reach the honey in the first-named flower. The honey is to attract them, and the lower lip is a secure alighting place for them, while the flanking walls direct their entrance into the honey tube and ensure their keeping in the precise position planned by the plant; the overarching roof is the exact size and shape to fit over their bodies as they probe within. Moreover, it holds the stamens and style (or ovary-column) rigidly in place, so that these cannot give way beneath the weight of the bee. Even the difference in length of the pairs of stamen-filaments has a reason. "If the anthers had lain side by side they would have formed a too broad surface, and the pollen would

Wild Flowers as They Grow

have adhered to parts of the bee's head which do not come in contact with the stigma, and would therefore have been wasted; perhaps, also, . . . it would have been deposited on the eyes of the bees, and might have so greatly inconvenienced them as to deter them from visiting the flower."* Both stamens and stigma are ripe together, but since the ovary-column tip hangs a trifle lower than the anthers, it is the first to touch the bee's back and thus secures pollen from another flower, provided the bee has brought any. If, however, it is the bee's first visit that day, no doubt then the flower perforce fertilises itself, but this is probably exceptional.

After fertilisation the corollas drop off, and only bunches of five-spiked calices remain. A glance within them shows at the bottom of each what looks like a minute green "hot cross bun." It darkens in colour, the quarters split apart and fall out eventually as dark nutlets, each containing a seed.

* Lord Avebury, quoting Dr. Ogle's suggestions.

The Red Dead Nettle

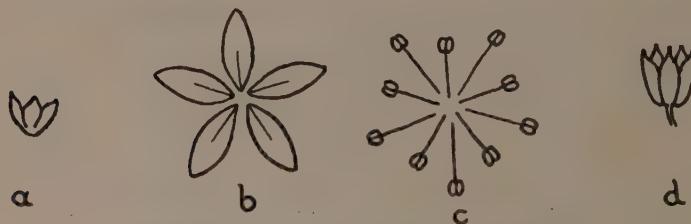
But the "red" in this plant's name does not refer to the flowers only. Often its leaves and its stems are also endowed with a reddish or purplish tinge. Especially is this the case when the plant's lot has not fallen in particularly happy quarters and it is having to make a brave struggle for existence. In olden days its leaves were among those which our ancestors used in compounding their "jowtes" or "joutes," otherwise their pottage. An ancient manuscript in the Sloane collection gives "cole, borage, persyl, plumtre leaves, redde nettil crop, malves green, rede briere croppes, avans, violet, and prymol" as suitable for "joutes." Some or all of these leaves were pounded in a mortar, then boiled with broth and served. There is no doubt that this nettle is a nourishing herb, and it is even said that its roots, boiled, form an excellent food for pigs.

The plant can be found in flower practically the whole year round, bravely struggling through a mild January as well as luxuriating on a hot midsummer day. A hard frost alone seems to spell its doom.

THE BITING STONECROP

SEDUM ACRA

THE Stonecrop is a standing illustration of making much out of little. Its bright golden stars touch with brilliancy old walls, stony places, and the faces of rocks and chalk cliffs, and its



a, sepals. *b*, petals. *c*, stamens. *d*, ovaries.

little fat, juicy leaves call up wonder in us that such succulence should be found in such unpromising and bare situations. On cottage roofs, too, it is often seen, particularly on old thatch, but its presence there is not so spontaneous as we some-



BITING STONECROP

The Biting Stonecrop

times imagine, for an idea was once rife that this plant, and perhaps more particularly its relative the house leek, were charms against witches and lightning, and hence they were often definitely planted on roofs, particularly by the Welsh, so that these dreaded enemies might be kept at bay.

The tiny, bolster-like leaves of this midget plant have no stalks, and lie closely pressing one behind the other on the one-, two-, or even three-inch high stems. Now their succulence is the plant's method of protecting itself against a possible—not a rainy but a dry day, for when moisture comes its way it stores it up in the tissue of the leaves, swelling them out considerably, so that when the inevitable drought comes—a contingency always before a little plant lying on bare stone—it can then draw upon them for its life, as a camel draws upon its hump. And the cylindrical shape of the leaves is also part of the scheme. In the flat, thin leaves of ordinary plants it is obvious we have the greatest possible

Wild Flowers as They Grow

surface in proportion to the quantity of internal tissue, and hence the greatest possible amount of transpiration ; in other words, the giving off of watery vapour, or, as we should say of ourselves, " perspiration." But in the Stonecrop, anxious to hoard every particle of moisture, the circular form gives the least possible transpiring surface to the luscious tissues it envelops, and hence transpiration is kept at the minimum. Further, in the Alpine regions, where the Stonecrops are all very much at home, and where sunlight and sun-heat are at a maximum, a dark colouring matter known as anthocyanine is formed by the sap, and it tinges the leaves a purplish-red and thus shields them from the sun's intensity.

These leafy reservoirs almost give the plant the proverbial nine lives of the cat. It is indeed difficult to kill a Stonecrop. Hung up high and dry in a window, it will live for weeks upon the contents of the leaves, its exposed roots even growing somewhat, and if placed within a reasonable time in

The Biting Stonecrop

water it will revive quite happily. Stories are told of mysterious growth—even after being pressed and presumably ended—between the paper sheets of a herbarium. Such succulency in barren places would, on the surface, appear to be the veriest tit-bits for hungry rabbits, but the Stonecrop well knows how to defend itself, and all through its tissues run hot, bitter juices that effectually keep off all but the more desperate; so hot and biting are they that they will blister the mouth if the leaves are chewed, and blister the skin too if the leaves are applied poultice-like to it. For this reason the plant is known variously as “Wall Pepper,” “Ginger,” the “Biting Sedum,” the “Biting Stonecrop,” “Pricket,” and “Prick Madam,” the last name being a corruption of its French name, “Trique Madame.” “Jack-of-the Butterie,” another of its homely names, is not easy to explain, but “Mousetail” is an obvious allusion to its small, upright stems with their imbricating leaves. The country name “Gold Chain” probably also alludes to these stems, as they are often a very

Wild Flowers as They Grow

yellowish-green, rather than to the golden flowers which have nothing chain-like about them.

About midsummer the little plant becomes a mass of starry blossom. Each blossom is quite regular and symmetrical in plan. There are five or six green sepals, the same number of yellow petals, twice as many stamens arranged in two rows, the inner row alternating with the outer row, and the same number of carpels in the centre, each distinct and containing several seeds. It is very curious how consistently the same number of parts, duplicated in the stamens, runs through the various whorls of the flower. If there are four petals we may be quite sure there will be four sepals, eight stamens and four carpels, and so, too, for five or six as the case may be.

When the flower-bud opens, the outer ring of stamens is quite ripe, and it stands erect, the anthers open and the pollen is shed freely. When emptied the filaments curl outwards and carry the anthers out of the way. The inner ring

The Biting Stonecrop

of stamens now raises itself and sheds its pollen in the same fashion. This done, they too retire, and next the stigmas of the ovaries in the centre come to the fore and assert themselves. Thus it is obvious that the insects who visit one golden flower after another, sipping the honey that is prepared for them at the base of the ovaries, will carry away pollen from flowers in the first two stages of development to put it on the stigmas of those flowers which have reached the third stage. Therefore there is every probability of cross-fertilisation happening. It is noteworthy that the honey lies within easy reach of short-tongued insects.

The fruit forms four, five, or six follicles as the case may be—dry, pod-like structures containing several seeds and splitting down one side only.

The plant belongs to the family of the *Crassulaceæ*, whose members always boast of succulent leaves. There are no fewer than nine species of *Sedum* or Stonecrop growing wild in our country,

Wild Flowers as They Grow

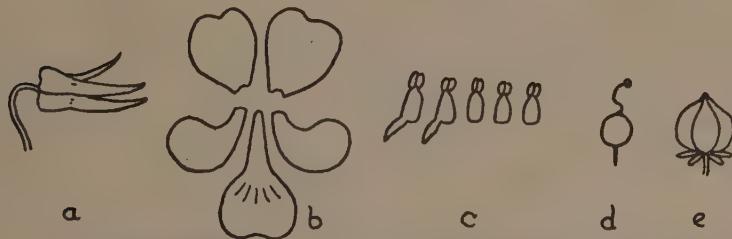
the one here described and the orpine being perhaps the two best known.

The old herbalists found a good many uses for the "Wall Pepper," and Culpepper shrewdly remarks, "it is so harmless a herb you can scarce use it amiss." It expelled poisons, much resisted pestilential fevers, and was "exceedingly good also for tertian agues." A favourite medicine was made by boiling it either in beer or milk, and the hot and biting liquid was drunk in considerable quantities with a corresponding amount of faith.

THE HEARTSEASE

VIOLA TRICOLOR

“THIS is that herb which such physicians as
are licensed to blaspheme by authority,
without danger of having their tongues burned
through with a hot iron, called an herb of the



a, sepals. *b*, petals. *c*, stamens. *d*, stigma, style, ovary. *e*, fruit.

Trinity.” Thus Culpepper, who never lost a chance to jibe at his confrères. The “Herb Trinity”—as, too, the Latin specific name, *tricolor*—refers to the purple, white, and yellow hues that give char-

Wild Flowers as They Grow

acter to the quaint face of the Heartsease. “ Jove’s own flower in which three colours meet ” ; or, as Cowley puts it :—

“ Gold, silver, purple are thy ornament ;
Thy rivals thou mightst scorn hadst thou but scent.”

This plant can claim distinction in having more homely names than any other of our wild flowers, and a review of them tells us much of the traditions that are bound up with it, and shows, moreover, how strong a hold it has exercised over man’s imagination.

It is “ Heartsease ” because it was reputed potent in love charms.

“ The juice of it on sleeping eyelids laid,
Will make a man or woman madly dote
Upon the next live creature that it sees,”

said Oberon in *Midsummer Night’s Dream* ; and Herrick embodies the same idea when he tells the story of those “ frolic maidens ” who died without sweethearts, and—



HEARTSEASE

The Heartsease

“Love in pity of their tears,
And their loss in blooming years,
For their restless here-spent years,
Gave them heart’s ease turned to flowers.”

A pretty, more spiritual, allusion is found in the “Pilgrim’s Progress,” where Christiana and her children in the Valley of Humiliation heard a lad singing, “He that is down need fear no fall ; he that is low no pride.” “Then said the guide, ‘Do you hear him ? I will dare to say this lad leads a merrier life and wears more of that herb called heartsease in his bosom than he that is clad in silk and velvet.’”

It is “Pansy” (French *pensées*) and allied names such as Spenser’s “pretty Pawnce” and Culpepper’s “pawncies” because, as poor Ophelia said, “Pansies—that’s for thoughts.” “Herb-Constancy,” too—“It is the faithfulest flower to plant upon a grave, for there will not come a day of the year when you will not find a Pansy in bloom.” And “Love in Idleness” :—

Wild Flowers as They Grow

“ Yet mark’d I where the bolt of Cupid fell ;
It fell upon a little western flower,
Before milk-white, now purple with love’s wound,
And maidens call it ‘ Love-in-Idleness.’ ”

This name appears, too, in variations, evidently senseless corruptions, such as “ Loving Idol,” “ Love Idol,” “ Live-in-Idleness,” and “ Living Idol.” Other ardent names of the countryside are “ Cull-me,” “ Cuddle me,” “ Cull me to you,” “ Jack-jump-up-and-kiss-me,” and that longest name, surely, ever invented for a plant, “ Meet-her-in-the-entry, Kiss-her-in-the-buttery.” “ Three faces under a hood ” and “ Monkey face ” refer to the almost human expression of the flower. One can only mention a few other names such as “ Kit-run-the-fields,” “ Pink-of-the-eye,” “ Flower o’ Love,” “ Pink-eyed John,” “ Bouncing Bet,” “ Bird’s-eye,” and “ Flammy ” ; that inexplicable name “ God-fathers and God-mothers,” and finally “ Step-mother,” which really has reason and a story behind it. There are two versions. The lower petal, large and imposing, is

The Heartsease

the step-mother; the two side ones, also in fairly brave attire, are her daughters; while the two top ones, which are but poorly coloured, are her step-daughters. The second version is given by the German girl who turns the flower upside down and points out the relation between sepals and petals. The step-mother, says she, sits on two stools, that is, two sepal-tops appear beneath the big petal; the daughters have a stool apiece, that is, one sepal-top stands beneath each; but the poor step-daughters in the attic have only one stool for the two of them, because there is only one sepal-top between them. And this brings us to discuss the quaint structure of the flower.

First there are five sepals with large ears projecting backwards from the point where they are attached. It is supposed that it is the plant's intention to build, by means of these ears, a barricade against small, creeping insects. Then there are the five petals, which form the characteristic flat face of the Heartsease; the largest one has a

Wild Flowers as They Grow

commodious spur running from its back, while its surface is marked by various lines—honey guides to the spur's entrance. We remember Milton's "pansie streak'd with jet." The stamens are also five in number, and two of these have small spurs, each carrying a honey sac at the end, which fit into the big petal spur and are protected by it. The big spur, too, collects and stores the honey that oozes from the nectaries. The stamen heads—the five anthers—are almost flat, and form a cone round the ovary column. Now this column is peculiar, for it has a kink at its base which acts as a spring, while on top, touching the big petal, it carries a truly remarkable structure in its stigma. So grotesque is it that one might imagine some midget animal skull was thrusting itself out from between the anthers, for it has a rounded head, a mouth with a lip that projects, and whiskers on either side. Mr. Step explains to us the meaning of this structure, and suggests that we test it by aid of a bristle to represent an insect's proboscis.

The Heartsease

“ The opening to the spur,” he says, “ is so restricted by a fleshy growth from each of the intermediate petals, that the only way to the honey is beneath the skull-like stigma. If the insect’s proboscis has already been dipped into a Pansy spur, and has come away with pollen attached, *that pollen will now be scraped off by the sensitive lip of the stigma.* On the other hand, to make as certain as evidence can testify that this is an arrangement to favour cross-fertilisation and prohibit self-fertilisation, when a bee’s tongue has got dusted with pollen inside this spur and is withdrawn, the slight pressure effectually shuts up the lip and closes the sensitive cavity against its own pollen.”

But the insect, in probing the flower, knocks its head on the stigma, which “ gives ” a little owing to the kink in its column, and this disturbs the cone of anthers. They have all already opened on the inside, and hence their pollen is lying loose around the style. It now promptly falls out on to the head of the bee, and dusts the proboscis too as it

Wild Flowers as They Grow

is withdrawn. As to the insects which act as chief emissaries for the Heartsease, one observer says they are thrips—i.e. small, wingless insects; but Charles Darwin found that humble bees were the commonest, though the moth *Pluvia* visited it largely, and a certain fly, *Rhyngia rostrata*, had been found more than once carrying Heartsease pollen. He noticed, too, how long it may be before flowers may receive the wished-for visitors. For instance, one year a clump of Heartsease was a fortnight before getting a bee visitor; another year a humble bee put in an appearance almost at once, with the result that all the flowers were fertilised and promptly withered and formed seed capsules; and he makes the interesting suggestion that “a certain state of the atmosphere seems to be necessary for the secretion of nectar, and as soon as this occurs it is perceived by various insects—I presume, by the odour emitted by the flowers, and these are immediately visited.” The fruit is a single-celled capsule, with the shining brown seeds arranged down

The Heartsease

three lines within it. When it is ripe it splits between the lines of seeds and opens out, forming three rays. The capsule-wall of each part closes up, so that each row of seeds lies, as it were, in an open pod. As the fruit dries the walls contract, and one by one the seeds are shot out to quite a little distance. Darwin considered that the cultivated Pansy rarely set seed if there were no insect visitors, but the little Field Pansy can certainly fertilise itself if necessary.

Though the Heartsease is a close relative of the violet—both belonging to the family *Violaceæ*—it does not produce any of those curious bud-like flowers—cleistogamous flowers—characteristic of the violet. Its ordinary showy flowers manage to come to fruition, so there is no necessity for any others. It is also careful to protect itself from rain and dew by drooping its head both at night and in wet weather, and thus the back of the flower and not its face receives the moisture.

The leaves of the Heartsease are rather long and

Wild Flowers as They Grow

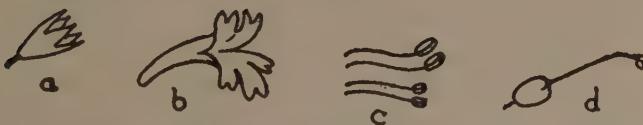
narrowish ; their margin is cut into rounded teeth. At their base they have two remarkable appendages—stipules—divided into lobes and often as large as the leaves themselves. The stem is branching.

But the whole plant is very variable and many varieties of it have been distinguished. The best marked of these are (1) the little Field Pansy, an annual to be found in flower the greater part of the year ; (2) the larger and handsomer perennial form often found in cottage gardens ; (3) an intermediate form common on mountain pastures.

THE EYEBRIGHT

EUPHRASIA OFFICINALIS

IS the little Eyebright a regular thief, or is it merely an individual which has, indeed, "commandeered" a partnership, but which makes some return for the benefits it takes uninvited?



a, sepals. *b*, petals. *c*, stamens. *d*, ovary, style, stigma.

The question is an interesting one. Undoubtedly it does prey upon other plants, though its appearance on the surface gives no hint of its nefarious doings. For it is a gay little plant to look at, as the picture shows; with no suggestion of degradation about it such as we have seen in the bird's

Wild Flowers as They Grow

nest orchis. Whatever may be its variations—and it does vary very much in size and general appearance—there are always bright green leaves opposite each other in pairs on the stem, and always gay little flowers, either pale purple or more often white, whose brilliance is enhanced by streaks of purple and spots of yellow. But under the surface of the ground all is not so satisfactory. Suckers from its roots spread around and lie on the rootlets of the grass plants which share the soil with it. Where they are in contact, tiny nodules form and send absorption cells into the grass rootlets. But the microscope proves how very small is the distance they penetrate, and therefore they can make but slight demands upon their host, though we cannot get away from the fact that there is a definite demand made. But, anyway, the grass preyed upon does not seem to suffer from the pilfering. Even in those mountainous districts where the Eyebright grows in such vast quantities that “at the season when its little milk-white flowers are



EYEBRIGHT

The Eyebright

open, regular milky ways seem to stretch across the green meadows," the pasture is just as flourishing as elsewhere. It is true that the German country folk call the plant *Milchdieb* (milk thief), and no doubt when the Eyebright comes into flower the milk supply lessens, but this is merely a coincidence due to the season of its flowering—late summer and autumn—being also the season of the cessation of the growth of the grass, and hence of the plentiful milk supply that the cows give. It has no direct connection with the plant.

Further, the Eyebright is an annual, renewing itself by seed from year to year, and the suckers of the grass roots to which it is attached also wither in those same autumn days; but Kerner suggests that probably before both wither the Eyebright may pass over to its host all those substances lying in its tissues which might conceivably be useful as storage during the winter, and thus it would help its host to lay by in its permanent roots reserves that can be drawn upon for early spring growth. And it is in

Wild Flowers as They Grow

this possibility that the redemption of the Eyebright from the ranks of the semi-parasites and its elevation to the dignity of partnership lies. Such co-operation is not at all uncommon in the plant-world—though botanists did not suspect it a quarter of a century ago—and a special term has been invented for it, namely symbiosis: that is, “associated existence for the purpose of nutrition.”

The variability of the Eyebright has led to much discussion as to how many species of it are known in the northern hemisphere. Bentham and Hooker consider there is only one very variable species; recently a German botanist declared there were fifty! But Lord Avebury endorses the first view, for he says he has found it in every possible degree of variation in Germany, France, and England alike, and hence it is impossible to define it into species. Sometimes it is a tiny plant, only an inch or so high, in a barren field; sometimes in luxuriant pasture a spreading tuft eight or nine inches high. Some-

The Eyebright

times the leaves are almost round, sometimes they are pointed and narrow ; their margins are, however, always deeply cut into teeth.

The flowers are remarkable in several ways ; their structure places the plant in the family of the foxglove and the speedwell—*Scrophulariaceæ*. The corolla is two-lipped, its lower, tube-like portion being enclosed in a green calyx tipped with four teeth. The upper lip is two-lobed, and arches over the stamens, and forms a shelter against the rain. The lower lip is spreading and three-lobed, each lobe being notched. A yellow patch emphasises the central lobe, and purple "honey guides" on both upper and lower lips point the way down the throat. Four stamens lie under the upper lip, and when the flower opens a long column from the ovary projects beyond them and presents the ripe stigma. The stamens are in pairs, one behind the other, and the eight anthers (each stamen has two) lie in two rows of four, and all are joined together. On the under side of each anther is a stiff spur, and the

Wild Flowers as They Grow

two lowest spurs are longer than the others and project over the throat of the flower. The upper spurs end in miniature brushes, which are intended to prevent the pollen being scattered at the sides and wasted. A bee comes—bees are the visitors for which the Eyebright caters—and, as it makes for the honey lying round the ovary at the bottom of the petal-tube, it is bound to knock the projecting anther spurs. The shake which it gives them is sufficient to set free the dry, dusty pollen that the anthers contain, and it falls on to the insect's head. If it came with a dusty head it will have already, as it entered, rubbed pollen on the outstanding stigma. Thus is cross-fertilisation managed.

But though the above is the normal arrangement of affairs, other and smaller flowers are sometimes found which suggest that self-fertilisation, rather than cross-fertilisation, is aimed at. Indeed, one German botanist insists that he has found seven forms of the flower. In these the corolla elongates,

The Eyebright

and, as the stamens are attached to it, their heads are gradually brought close up to the stigma, and eventually their pollen will fertilise it. The seeds in all kinds of the flower are produced in tiny capsules.

To our forefathers this plant was also of absorbing interest, though they knew nothing of its scientific aspects. *Euphrasie* (or “Euphrasine,” as they called it) was to them a specific for bad eyes. Milton relates how the Archangel Michael ministered to Adam after the Fall :—

“ To nobler sights
Michael from Adam’s eyes the film removed
Which that false fruit which promised clearer sight
Had bred ; then purged with euphrasine and rue
His visual orbs, for he had much to see.”

Old Culpepper declares that “if the herb was but as much used as it is neglected, it would half spoil the spectacle makers’ trade.” “Tunned up with strong beer,” or “mixed with sugar, a little mace and fennel seed,” or “eaten in broth,” he asserts

Wild Flowers as They Grow

that it "will help and restore the sight decayed through age." A certain Arnoldus de Villa Nuova taught that it would give sight even to those who had become stone blind ! Even the birds knew of its marvellous virtue, the linnet in particular using it to clear the sight of its young, as tradition of great antiquity teaches. Gerard writes that the powder of the Eyebright mixed with mace "comforteth the memorie," and Culpepper endorses this —"it also helps a weak brain, or memorie."

The origin of the belief in its value as an eye medicine lies rooted in that old heresy the Doctrine of Signatures—namely, that every plant gave an outward sign of its inward grace so far as mankind is concerned; and an old writer points out that "the purple and yellow spots and stripes which are upon the flowers of the Eyebright doth very much resemble the diseases of the eye, as bloodshot, etc. By which signature it hath been found out that this herb is effectual for the curing of the same." A hopelessly unreliable guide, as we now know.

The Eyebright

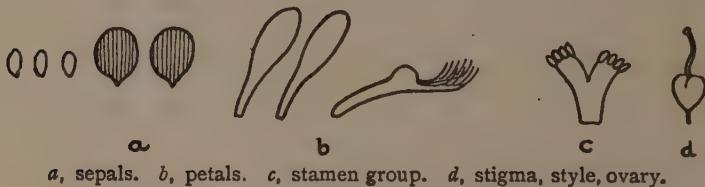
Nowadays modern medical science ignores the plant, and its reputation has completely vanished, unless, perchance, it still lurks in some old wife's lore in remote cottages.

The plant is named after Euphrosyne, one of the three Graces, who was distinguished for her joy and mirth.

THE MILKWORT

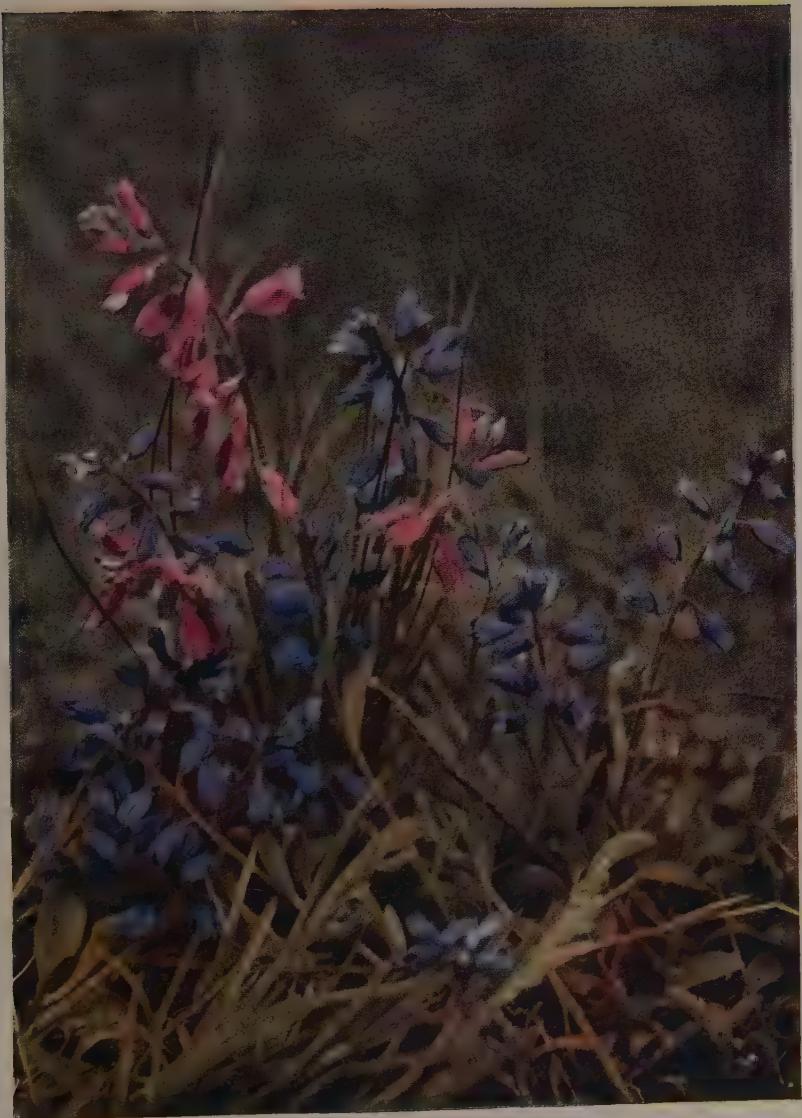
POLYGALA VULGARIS

IN every country the Milkwort has been associated with Rogation-tide—with those days in May in the week next but one before Whitsuntide, when processions went, and still go, round many a



a, sepals. *b*, petals. *c*, stamen group. *d*, stigma, style, ovary.

parish, asking for blessings upon crops and homes, and praying for protection from plague, fire, and wild beasts. Those in the processions carried flowers, and the little red and blue flowers of the Milkwort were chief among these, "which floures the maidens which use in the countries to walke



MILKWORT

The Milkwort

the Procession, do make themselves garlands and nosegaies," says Gerard in the days of "good Queen Bess." And since the week was known as Rogation, Cross, or Gang Week, so the flower was called "Rogation," "Cross," or "Gang Flower." Sometimes, too, "Procession Flower" and "Grace of God." And because the Rogation processions are undoubtedly direct descendants of the Roman *Ambarvalia* procession in honour of Ceres, the goddess of corn, we find the Dutch herbalist, Dodonæus, a contemporary of Gerard, writing of this flower as *Flos Ambarvalia*.

The Milkwort is certainly an attractive plant as it grows over the uplands close to the earth. Attractive singly for its quaint, unusual flower-structure, and wholly attractive in the mass from the vesture of pinks, purples and blues with which it clothes large areas of the Downs as the spring of May gives way to the summer of June. A modern writer,* describing the colour scheme of the Downs in spring-

* Maurice Hewlett.

Wild Flowers as They Grow

time, says, " Then for a shelf among rocks the milk-worts, the sky-blue, the white and the pink ; with these I float out May like Fra Angelico," and as one recalls the tender reds and blues of the great Italian painter the simile seems very apt.

Why the Milkwort is sometimes pink and sometimes blue is a mystery. Lord Avebury himself asks, " Why is this ? " But the answer has yet to be found, and no plausible suggestion seems even yet put forward. The plant is a perennial with a tuft of slightly shrubby stems, sometimes only an inch or two high where the situation is exposed, and sometimes as much as a foot tall in a more favoured spot. The leaves vary very much. The lower ones are crowded together and more or less oval in shape ; higher up they are longer and slighter, while near to the flowers they may be quite narrow. At the top of each stem is a spike of flowers in all stages, the older at the base, and these flowers are most quaint and " fashioned like a little bird with wings, taile and body, easie to

The Milkwort

be discerned by them that do observe the same," as the afore-mentioned Gerard says. He thought, too, that the red, blue, purple and white Milkworts must necessarily be all different kinds of Milkworts, though his careful observation told him that, apart from colour, each one "was like unto the rest in each respect." At the first glance one might imagine that one was dealing with some flower of the butterfly type, of the family *Leguminoseæ*, but a closer investigation shows that the resemblance is only a superficial one. As a fact, the Milkwort stands all by itself in the flora of our land; not only as the sole representative of a genus, but as the solitary specimen of a whole family. No other plant of the *Polygalaceæ* family is known wild in Great Britain. We must go to the tropics, and more especially to South Africa, if we would wish to find the family at home.

Pick off from the main stalk a flower with its little stem and small leafy bract, and pull it carefully to pieces. Even the sepals—so often uninteresting

Wild Flowers as They Grow

—are full of character. Three, it is true, are small and greenish, but the other two spread out largely, like wings, gaily coloured and beautifully veined. It is this pair of bright sepals that gives the flower a butterfly-like appearance. The petals are small, and are united into a tube; near the top is a little crest formed by a pair of finger-like processes, but what precisely is its value to the flower is not known. The lowest petal is concave, and its apex turns upwards and forms a sort of hood. White hairs, pointing downwards, fringe the tube. There are two sets of stamens, their heads closely set upon the corolla tube; in each set are four anthers. In the centre of the flower is the ovary, two-celled, a seed in each cell; on it is the curving style which ends in a peculiar expanded stigma, sometimes described as spoon-shaped. Now the stamen heads lie just above this "spoon," and since the pollen falls out of them through pores at their tips, it must fall into it—we remember the flower hangs a little droopingly. Then the stamens withdraw a little.

The Milkwort

Now close behind the “spoon” hollow is a very sticky disk, and when an insect thrusts its proboscis into the flower in its honey quest this touches the disk and becomes sticky. Hence, when it is withdrawn again, some of the pollen lying in the hollow sticks to it and is carried away. Imagine next the insect going on to the second flower, and inserting its proboscis. The pollen grains upon it are now scraped off by the edge of this flower’s disk, and apparently they fall also into the hollow, while some of the pollen already there is carried away. It is, however, difficult to follow the plans of this peculiar flower. Perhaps it is sterile to its own pollen, but in any case we do not seem yet to understand how precisely it has arranged for its fertilisation to be carried out, any more than we know why it is both red and blue, and why one of its petals carries a crest. Its fruit is a little, round, hairy capsule with a narrow notched wing ; the two seeds are oblong and also hairy. It is an interesting fact that directly fertilisation is effected the two wing sepals lose their colouring and

Wild Flowers as They Grow

become green, as if to signal to bees and other insects that their visits are no more desired.

At one time the plant had considerable medicinal repute. Its common name, Milkwort, refers to the belief that it was good for nursing mothers. The flow of milk in cows was also supposed to increase if this flower flourished in the pasture. Its Latin name—*Polygala*—supports this belief by signifying “much milk.”

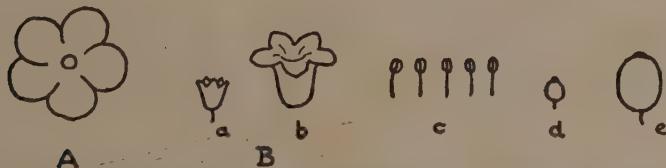
THE GUELDER ROSE

VIBURNUM OPULUS

THE wild Guelder Rose of our thickets does not possess, it is true, the

“Silver globes, light as the foaming surf
That the wind severs from the broken wave.”

that Cowper describes as the possession of his “scentless rose,” the Guelder Rose of our gardens, but its



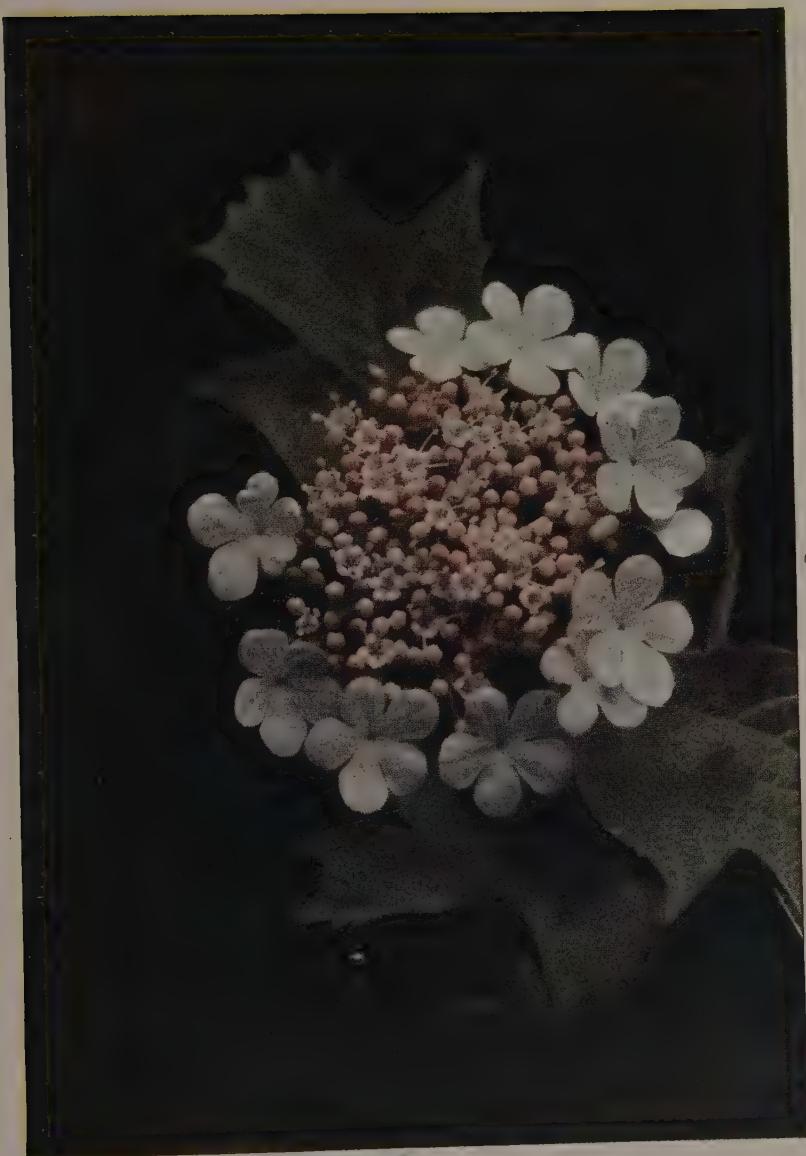
A, outer sterile floret. *B*, inner fertile floret. *a*, sepals. *b*, petals. *c*, stamens. *d*, stigma, ovary. *e*, fruit.

existence is more uniformly picturesque, and its life has more points of interest about it than has that of its cultivated sister. “Silver globes” are

Wild Flowers as They Grow

all very well while they last, but if they are only apologies for flowers and lead to nothing, interest wanes as they fade ; while, on the other hand, the wild Guelder Rose claims our attention from the moment its buds burst in the spring to the winter day when its last jewel berry is carried off by a bird.

It is a shrub, usually from nine to twelve feet high, with smooth stems and handsome leaves cut into three lobes, strong-veined, and with sharply toothed margins. The teeth of the leaf margins are coated with a varnish which is able to collect and absorb moisture from a damp atmosphere, but which acts as a strong preventive against evaporation from the leaf tissues when the air is dry ; so it has a double function in securing moisture to the plant. The leaves arise in pairs, and tend to group themselves in fours ; indeed, the mosaics they form in their efforts to keep their faces to the light and not to be over-shadowed are often very neat. At the base of each leaf-stalk are two tiny thread-like appendages, each carrying a honey gland at its tip ; and



GUELDER ROSE

The Guelder Rose

there are other similar glands on the stalk just below the blade. Probably they are designed to distract the attention of small and useless creeping insects from the flowers. Since the flowers are always at the ends of the branches, such insects necessarily have to pass these enticing lures on their way up, and no doubt succumb to them. Lord Avebury suggests that perhaps they provide food for caterpillars, which would otherwise attack the very tender young leaves; also, that by attracting bees and wasps, a bodyguard is formed of these insects to keep off caterpillars, and he fortifies his suggestion by the remark, "Indeed, it has appeared to me that on specimens of *V. opulus*, which are much frequented by wasps and ants, the leaves are less eaten than in other cases where they are not so protected."

In June the flowers arrive—flat clusters which always seem to suggest that only those at the margin ever come out, and that the central ones remain as perpetual buds. But the fact is that in its flowers

Wild Flowers as They Grow

the Guelder Rose has gone far along the path of altruism. In most other flowers—the daisy, for instance—where there has been a sacrifice to provide greater attractiveness, the showy ray florets at least retain their ovaries and seeds intact, though renouncing their stamens; but the Guelder Rose's attractive florets—the dozen or so snowy white ones that surround each of the clusters—have given up everything to the greater development of their petals, and are absolutely sterile and for the most part absolutely empty. Rudiments of stamens and ovary may sometimes be found within, but they are merely reminiscences of a far distant past when they took their share in the direct propagation of the plant. The development is altruistic because their attractiveness can in nowise benefit them; it is purely to call attention to the insignificant but perfect florets that they ring round so brilliantly. These inner florets are greenish-white, and small but perfect—each with a tiny green calyx tipped with five teeth, a whitish cup of a corolla formed by five

The Guelder Rose

petals, five stamens set low down in the cup, and an ovary containing a single seed. Two or three stigmas on top of the ovary suggest that once there were more compartments and more seeds. A layer of honey lies in the cup, and the flower has two sets of visitors—firstly, little flies to lick the honey, and, secondly, bees, not so much after the honey as after the pollen. But even without insect carriers the flowers are so placed that pollen from one must often fall on and fertilise a neighbour. Both stamens and stigmas are ripe together.

As the result of fertilisation the fruits form, and it is here that the wild species has such an amazing advantage over that of the garden. Since the “silver globes” were produced by the multiplication of the outer attractive but sterile florets and the elimination of the inner fertile ones, there is no fruit possible, while now the wild form is fast becoming, under the mellowing of the autumn sunshine, “a shrub that seems to have come from the garden of Aladdin, where the fruit of the trees were jewels.” For the

Wild Flowers as They Grow

berries that form from the insignificant florets are at one stage oval, translucent, ruby-like ; at a somewhat earlier stage they are clear golden drops ; at a later they pass into deep purples, and as they hang together, weighing down the delicate branches with their heavy lusciousness, they do indeed look like clusters of precious stones. The leaves, too, do their share in enhancing the gorgeousness of the autumn colour scheme, for their green changes into rich crimsons and purple-browns, and the tree becomes a mass of vivid hues. None of our other native berries can approach these in loveliness ; but beautiful as they are to look at they are bitter and rasping to the taste, and, when crushed, smell somewhat disagreeably. As, however, they quickly disappear from the boughs, they are no doubt quite acceptable to birds. Each contains a single seed. In Siberia the berries used to be, and probably still are, fermented with flour and a spirit distilled from them. They were also used to flavour a paste of honey and flour.

The Guelder Rose

The name "Guelder Rose" comes from Guelder-land, a Dutch province, where the tree was first cultivated. In this case the usual procedure has been reversed, for a name (in this case Dutch) of a cultivated tree has been transferred to the wild form. Old English names for our plant are "Rose Elder," because of a similarity to the elder, "Silver Bells" (a Wiltshire name), "May Bells," "May Rose," and "Snow Toss." Since the tree often comes into bloom about Whit-Sunday it has long been associated with that festival, and is known as "Whit-Sunday Flower," "Whitsun Rose," and "Whissentide Bosses" (bushes?). "King's Crown" is a name given to it in the Cotswolds, because the King of the May was crowned with it.

The family of which the Guelder Rose is a member is the *Caprifoliaceæ*—the family of the honeysuckle, the moschata, the elder, and the wayfaring tree; and within this family the Guelder Rose and the wayfaring tree are our native representatives of its subdivision, the genus *Viburnum*. The laurus-

Wild Flowers as They Grow

tinus, which hails from South Europe, is associated with them in this division. The Wild Guelder Rose may always be known from the wayfaring tree by the fact that, though both bear clusters of whitish flowers, only the Guelder Rose has the outer ring of large attractive florets. Also its lobed, smooth leaves are a sharp contrast to the simple undivided leaves, with downy under-surface, of the wayfaring tree.

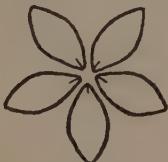
THE YELLOW LOOSESTRIFE

LYSIMACHIA VULGARIS

THE Yellow Loosestrife is a plant that "wants knowing," as we say of those people whose worth is not quite apparent at a first glance. Common, but not very familiar, its yellow spikes,



a



b



c



d

a, sepals. b, petals. c, stamens. d, stigma, style, ovary.

as they top the herbage on some shady bank or give a touch of gold to stream-side vegetation, scarcely perhaps suggest the scientific and legendary romance that is bound up with it. They do not hint, for instance, that the life of one member

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of the insect world is indissolubly bound up with it ; that its flowers may vary fundamentally ; that it tamed wild beasts, and had other reputed powers of mystic nature ; yet all these things form part of the story of the Yellow Loosestrife. Let us imagine, then, that we are pushing aside the growths that hem it in, so that it is set in isolation ; and let us see what impression we gain from our first casual glance.

It stands before us a tall, handsome plant, two, three, or even four feet high. Its stems are slightly branched, and are covered with a soft, fine down, while closely set upon them are a number of stalkless leaves. Sometimes these are in pairs ; sometimes they arise three or four together. They are rather large and broad, ovate or lance-shaped, and sharply tapering at the tip ; their edges are unbroken, and they also are downy on their under-surface, while their upper surface is marked with black dots which speak of glands. Towards the top of the stem flower-buds arise, just above the points



YELLOW LOOSESTRIFE

The Yellow Loosestrife

where the leaves do. Each becomes a short stalk carrying a terminal flower ; below this flower other flowers on smaller stalks arise, and thus the ends of the main stalks become covered with a golden spike of blossom.

We next draw a spike to us and note that each flower is a scalloped cup, for the five petals, though quite distinct at their tips, are joined together near the base. Where the flowers droop, the green calyx —a five-pointed star whose edges are delicately fringed with tiny hairs—can be seen at the back of the petals. The five stamens look distinct, but really they are joined together at the bottom by a fleshy band which is attached to the petals, so that they seem to stand on a little glandular tube. But there is no honey in this tube, as one would rather expect ; nor, indeed, in any part of the flower ; neither is there any scent. Finally, in the centre, is the round seed-case with its column flanked with fine hairs and topped with a two-branched stigma.

Now this flower has apparently specially appealed

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to one particular kind of bee, by name *Macropis labiata*. It may, and probably does, have other visitors as well, but *Macropis labiata* will visit, for its part, no other flower, and hence where the Loosestrife does not grow the Macropis does not appear to exist. An alliance such as this between insect and flower is not unknown in other cases ; the field scabious, for instance, has a similar loyal lover in a bee of the *Andrena* species. Since there is no honey in the Yellow Loosestrife it is difficult to know why it is so eagerly sought by this bee, but perhaps the insect has acquired a taste for that particular flavour of sap that lies in the glandular stamen tube. Anyway, its visits no doubt result in transference of pollen from one flower to another on the same spike and occasionally from one spike to another.

But dependence, either wholly or largely, on a single kind of visitor is always unwise, and therefore on the Yellow Loosestrife may be sometimes found smaller, less attractive looking flowers which

The Yellow Loosestrife

in no way cater for or anticipate visitors. In fact, they are specially constructed to be self-sufficing in the matter of fertilisation. The style, or ovary column, is here short, and two short stamens stand by it. These, when ripe, pour out their pollen directly on to the top of the column, and this is potent to fertilise the waiting ovules.

As a result of fertilisation, whether self or insect effected, the ovary develops into a rounded capsule which eventually dries and opens at the top by five valves. Then the swaying of the stems by the wind jerks out the minute seeds.

The Yellow Loosestrife has a creeping root which persists year after year, and every spring throws up afresh the tall, golden-topped stems. The flowers are at their best in July and August.

Both the scientific and the popular names of this plant have interesting origins. *Lysimachia* is supposed to be after King Lysimachus of Sicily, who, in days prior at least to Pliny, discovered medicinal properties in it. A belief in these pro-

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perties persisted for many centuries ; it was "a singular good wound herb for green wounds" ; in fact, it had a great reputation for staunching bleeding of any sort. Its common name of "Loose-strife" is a very old one, and refers to the belief that this plant would quieten savage beasts ; in particular, it had a special virtue "in appeasing the strife and unruliness which falleth out among oxen at the plough if it be put about their yokes." The truth is, the plant seems to be obnoxious to gnats and tiresome flies, and no doubt placing it under the yoke relieved the poor beasts of their tormentors, and thus made them quiet and amenable.

So we hear of—

" Yellow Lysimachies to give sweet rest
To the faint shepherd, killing where it comes
All busy gnats and every fly that hums."

COLLINS.

For the same reason the dried herb used to be burnt in houses, so that the smoke might drive away gnats and flies ; while snakes and serpents—which

The Yellow Loosestrife

ever seem to have been in the thoughts of our forefathers—are said to have made themselves scarce directly the fumes came near their quarters. In particular was it valuable in marshy districts.

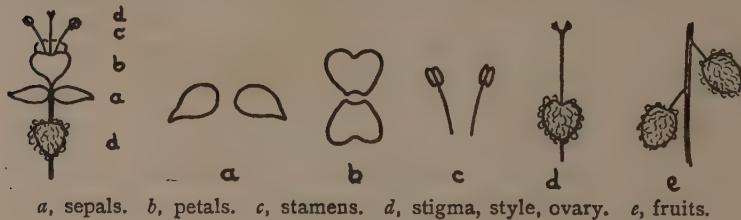
The plant was often known as the “Yellow Willow Herb,” “Herb Willow,” or “Willow Wort,” and classed with the true willow herbs, which belong to quite a different family—i.e. *Onagraceæ*—because there was a superficial resemblance between them, especially with regard to the leaves. The *Lysimachia*, however, belongs to the same family as the primrose and the pimpernel—namely, the *Primulaceæ*.

Four species of *Lysimachia* are native in this land—the Yellow Loosestrife; the moneywort, our familiar Creeping Jenny; the wood lysimachia or yellow pimpernel, which is remarkably like the scarlet pimpernel in general habit and particularly in the form, though not the colour, of the flowers; and the tufted lysimachia, which is rare, and confined to northern England and central Scotland.

THE ENCHANTER'S NIGHTSHADE

CIRCAEA LUTETIANA

THE romantic name seems ill to fit the mean-looking little weed, but imagination fills up gaps and pictures all sorts of weird traditions and medieval episodes underlying its significance and



a, sepals. *b*, petals. *c*, stamens. *d*, stigma, style, ovary. *e*, fruits.

transforming it with a magic touch, and the disappointment is therefore a double one when we find that the name and the plant are singularly out of harmony—a rare occurrence, indeed, with our English wild flowers. In the first place it is not a nightshade at all, not having the remotest



ENCHANTER'S NIGHTSHADE

The Enchanter's Nightshade

connection with the true nightshades, such as the deadly nightshade (*Atropa belladonna*) and the woody nightshade (*Solanum dulcamara*) described in our previous volumes. (It is suggested, however, that there is some resemblance between its leaves and those of the deadly nightshade, and hence the mistake.) In the second place, neither enchanters nor wizards, nor indeed any such-like folk, ever have had or wished to have anything to do with it, for it was never considered by them to be "a plant of power" or potent in spells. In fact, the name is a mistake—a very old one, however, which was pointed out more than three hundred years ago—some inexplicable confusion having arisen before that time between this weed and the mandrake, a plant that all the world knows was ever one of deepest mystery and blackest magic. But a mistake that has survived so long is not likely now to be set right, and the plant retains its name.

But if from the romantic and traditional side

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the plant has nothing to offer, things are different when we take it in its scientific aspect. There is plenty of interest in it there, and we shall find the reason that it is overlooked is simply because of the general smallness of the flowers, their diameter not exceeding one-eighth of an inch. It belongs to a family only slightly represented in this country by the willow herbs, the evening primrose, the marsh ludwigia, a rare plant, and the two *Circæa*—namely, the Enchanter's Nightshade and the little Alpine *Circæa*—but which has distinguished foreign members such as the fuchsias, natives of South America, and the clarkias of North America. It loves damp places in copse and lane, and damp nooks in gardens, and grows about a foot or perhaps more in height.

Its leaves are rather large in proportion to its size, and their dark-green, heart-shaped blades, slightly notched at the edges, are held out in pairs on long stalks. The roots creep deep in the ground and are very strong ; and as the plant is a perennial

The Enchanter's Nightshade

they are difficult to get rid of, and so the Enchanter's Nightshade is apt to become a nuisance in a garden where it has once made its home. Further, tubers appear on the ends of the rootlets at a little distance from the plant, and these bud and give rise to new plants, and colonies are formed.

The tiny pinkish flowers grow in spikes or racemes, some twenty or forty together. A raceme is a spike of flowers where each has a stalk, and the older flowers are towards the base and the buds at the top. If we take a spike that has been flowering a little time, we can see spread out before us at a glance all the various stages in the flower's life, from just emerging buds to ripe fruit. At the very tip, then, the buds are wholly green; just below, buds hint of pink petals; then come newly opened flowers. Examine one of these. Directly underneath the calyx is a pear-shaped ovary covered with tiny, hooked hairs, the hooks turning downwards. The top of the ovary is carried up rather curiously into a pedestal, on which the rest of the

Wild Flowers as They Grow

flower is set so that it is lifted above the ovary. Notice that the parts of the flower are always in twos—a very rare occurrence. First, there are two green sepals opposite to each other and bending downwards. Alternating with them are a pair of pinkish-white petals, making a brave show considering there are only two of them, for each is heart-shaped, with the broad notched part outermost and the attachment at the apex. Then come a single pair of stamens in the spaces between the petals. In this flower they are erect, though stretching somewhat outwards. Their small anthers contain pollen grains marked by curious warts, over which the outer, very fine skin of the grain is stretched. In the centre of the flower is a single, long, upright column, thickened at the top to receive pollen, and communicating directly with the ovary away below the sepals. This ovary is two-celled, and in each cell is a single seed. Finally, we find honey sweetening the flower, but there is no appreciable scent.

The Enchanter's Nightshade

Now at this stage if any pollen-laden insect should favour the Enchanter's Nightshade with a visit then cross-fertilisation would probably take place, as the long stigma would almost certainly be touched before the diverging stamens. But insect visitors are few and far between, the plant making such an insignificant appeal to them, so it would be most unwise to risk posterity upon the chance; therefore there are further developments, which are shown in the slightly older flowers immediately below. In these one detects that the stamens are gradually curling over towards the centre of the flower, and soon both have approached the stigma and touched it; and now "the stigma looks as if it were grasped by a pair of tongs," says Kerner. Sometimes one anther alone touches it, but always pollen is laid on it by one or both. Then the grains laid on the green tissue of the stigma swell, and, at a certain thin spot, the protoplasm issues almost like a rootlet from a seed and finds its way down the erect column right through the

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flower to the pear-shaped ovary, and there it touches and merges with an immature seed lying in one or other of the two cells.

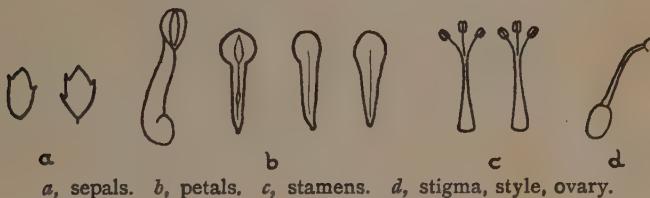
As soon as fertilisation has happened, sepals, petals, and stamens fall off, and this stage is shown on the spike, in the naked ovaries held aloft on the ends of flower-stalks. Below these are the fruits forming, and it is very noticeable that the flower-stalk at once drops through a right angle, and at the base of the flowering spike the little hairy fruits are all hanging. They turn dry and brown, and the coat of bristles hardens somewhat so that a small burr is formed. Because the burr catches on to anything passing, Boerhaave—a Swedish botanist—believed that the plant derived its name *Circæa* from this characteristic, “the fruit laying hold on the clothes of a passenger and drawing them to it, as Circe was fabled to attack by her enchantments”; but the idea is rather far-fetched.

The plant is found in flower during July and August.

THE FUMITORY

FUMARIA OFFICINALIS

THIS "very tender little herbe," with its blue-green, fern-like foliage, and its spikes of quaintly shaped pink flowers that an old writer once compared to little birds, is quite distinctive



a, sepals. b, petals. c, stamens. d, stigma, style, ovary.

among our wild flowers. For some reason or another—many are put forward—it is always associated with smoke and the earth. It is "Smoke Earth" in Scotland, "Fume-terre" in France, "Fume of the Earth" with us. One legend says that it has its origin, not from seed, but from the

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vapour or smoke of the earth; Pliny told us it caused the eyes to water, as smoke does (but this only explains half the name); an old tradition asserts that it was burnt by exorcists when they were driving evil spirits out of their patients; but probably the true reason is that given long ago—namely, that if a mass of this plant is creeping on the ground it looks “as if the earth were all of a smoak.”

It is a plant that evidently struck the imagination of our forefathers, for we constantly find them referring to it; indeed, they seem to have known it better than the average person does to-day. Here is a description taken from a fourteenth-century manuscript:—

“ Fumiter is erbe I say,
Yt springyth in April et in May,
In feld, in town, in yard et gate
Yer* lond is fat and good in state;
Dun red is his flour
Ye erbe smek†-lik in colour.”

* Where.

† Smoke.



FUMITORY

The Fumitory

But for the spelling, this description might be taken from a modern schoolbook. For the Fumitory is a weed of cultivation—that is, it occurs in waste places on the edges of cultivated land where the soil is good; it is chiefly common in the cornfields, as Shakespeare knew. Did not Cordelia see her poor, mad father, King Lear—

“Crown’d with rank fumiter, and furrow weeds,
With harlocks, hemlock, nettles, cuckoo flowers,
Darnel and all the idle weeds that grow
In our sustaining corn.”

It is sometimes asserted that it is not a native plant at all, but a migrant from the Continent, brought in through agriculture. But if that be so, the centuries it has been here may be considered to have naturalised it. It first springs up as a clump of leaves, each leaf being a pretty grey blue-green colour, and divided into many segments, so that it rather reminds one of some kinds of maidenhair fern. The texture, too, is fine and delicate. As the days pass the stem lengthens, but is always

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weakly, and either trails along the ground for a couple of feet or else attempts a little climbing by the aid of its leaf-stalks. The flowers grow in spikes, the youngest buds at the top, and they appear as if they were attached at the side rather than at their base to their very short stalks. Each is pink (rarely white), the pink deepening into a purplish hue at the tip ; and their shape and colour have given the plant the name of "Wax Doll" in Kent and elsewhere.

Now let us notice a flower more particularly. Its structure is uncommon and remarkable. There are two small sepals, one on either side, shaped like a tiny leaf with notched edge. The petals are four in number, and form a long, tubular box. The top petal forms a sort of hood in front, and its base tails back as a short, thick pouch. It is this projecting pouch that makes the stem appear to be attached at the side of the flower. The bottom petal is narrow, and ends in a point. The edges of the two side petals fit inside

The Fumitory

the upper and lower petals, so that the tube is formed. Now it would be very difficult for an insect to get inside this tube, closed as it is in front by the hood of the upper petal, were it not that each side petal has a hinge near its base; thus, any pressure upon them causes them to fall a little and carry the bottom petal with them, so that an entrance is made for a visitor. Directly the pressure of the visitor is removed the hinges act as springs, and draw the petals back into their original position. If we cut away a petal and look inside the tube we find there two groups of stamens, three in each group. From the top group there runs back into the petal pouch a thick spur, which is really a nectary exuding honey. Now when we closely examine these stamens we discover a very curious fact. The centre one of each group is a whole stamen with two pollen boxes on top; but the two flanking stamens, though they do not look much different, are really only half stamens, with one pollen box at top. The fact is, this flower originally started

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with four perfect stamens, but the top and bottom ones (facing the sepals) have divided into two and the halves have moved apart and stand by the side ones, so that we get two lateral groups of three.

There is an egg-shaped ovary with a column running between the two stamen groups, and a stigma which lies between the pollen boxes. Knuth, who has made a definite study of the pollination of flowers, says that the Fumitory is a "bee-flower," making a special appeal to, and being constructed to receive, bees as visitors. Lord Avebury comments, "bees, however, do not seem to take much notice of them"; and he throws out a suggestion, "perhaps they are fertilised by night insects." Other observers believe that, whatever may have been the original aim of the plant, nowadays it always fertilises itself inside the hood. The ovary starts with containing two ovules, but only brings one of these to maturity. It seems a waste of material to us to-day, but no doubt it is a survival of older conditions. This jettisoning of one potential

The Fumitory

seed "perhaps is an advantage in lightening the fruit and thus tending to promote dispersion," hazards Lord Avebury. Eventually we know the fruit as a small, roundish, green nut, flattened at top, and containing a single seed.

The Fumitory has been credited with all manner of diverse virtues. We are gravely told by old herbalists that Saturn owned the herb, and therefore if you found Saturn was the author of your disease, or "if by direction from a nativity you fear a saturnine disease approaching, you may, by this herb, prevent it in the one and cure it in the other, and therefore it is fit you keep a syrup of it always by you." So much for Dr. Culpepper. Boiled in water, milk, or whey, it had a great reputation as a cosmetic. John Clare's old rhyme is familiar :—

" And fumitory too—a name
That superstition holds to fame—
Whose red and purple mottled flowers
Are cropped by maids in weeding hours,

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To boil in water, milk, and whey,
For washing on a holiday,
To make their beauty fair and sleek,
And scare the tan from summer's cheek."

While a piece of doggerel of great antiquity runs:—

"Get water of fumiter liver to cool,
And other the like, or go die like a fool."

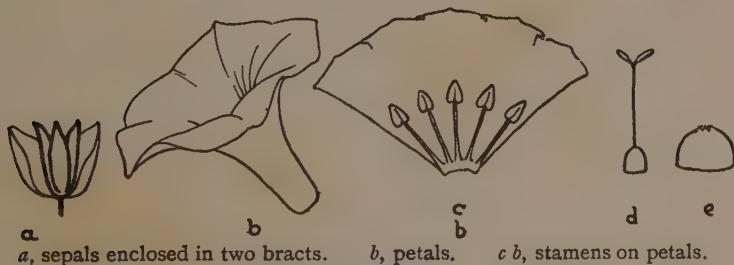
It is rather strange that a plant to which remedial virtues were once so warmly ascribed, and apparently on such high authority, should now not find even a humble place in our *materia medica*.

The Fumitory has spread almost all over the globe. It belongs to quite a small family of plants—the *Fumariaceæ*—closely allied to the poppies. There is no other species of Fumitory among our wild plants, though varieties of this species are found. The only other members of its family in England are the yellow and climbing corydalises.

THE HEDGE CONVOLVULUS

CONVOLVULUS SEPIUM

THE Hedge Convolvulus is specially interesting as a flower with a partner in the animal world—a certain crepuscular moth, known as the Convolvulus Hawkmoth, or the Unicorn Hawkmoth



a, sepals enclosed in two bracts. *b*, petals. *c* *b*, stamens on petals.
d, stigma, style, ovary. *e*, fruit.

(*Sphinx convolvuli*). If its partner fail it, as is often the case in England, then its plans cannot mature successfully; and where its partner is non-existent so, too, must it be scarce, as we shall see.

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But it awakens our interest also on other counts. In the first place it is built on handsome lines, and this, too, in spite of the fact that it has not much "backbone." In the second place its stems are trailers, and, as they make their way rapidly over the hedgerows, their tips are continually revolving in a direction opposite to that of the sun—a revolution taking, usually, a little less than two hours. Directly the free end of the stem in its movement comes into contact with a twig or support of any sort, it is specially stimulated to twist round it, and from this point of attachment it continues its growth and revolutions. How rapid is this progress may be judged from the fact that, although it dies down every year, trailing branches, two to three yards long, may be disentangled in the late summer time.

Let us look closely along one of these stems as it tops the hedgerow in July and August. At regular intervals are the leaves, singly, on short, slender stems, plain and handsome in outline, with



HEDGE CONVOLVULUS

The Hedge Convolvulus

broad, lobed base and tapering apex. Sometimes they are quite triangular, their basal lobes cut sheerly; sometimes they are more nearly heart-shaped. Flower buds also arise at the same point, one to each leaf, and on any trail the life history of a single flower may be read at a glance in the successive stages of development that are spread before us. Working backwards from the tip we find narrow, pointed green buds in graduated sizes borne on slight stalks; next comes a bud, green at the base, pure white above, the delicate petals in a long, spiral twist—the turn being to the right. Then comes a perfect flower of much beauty, where the twisted petals have opened into a wide, trumpet-shaped blossom, large and stately in its whiteness. This is succeeded by what is apparently a bud, for, when the single day's glory allowed the flower is over, the petals in their withering fall back into their bud form, as old age falls back into childishness. But after a stage or two of increasing dilapidation the petals drop, and only too often a seed-case of

Wild Flowers as They Grow

worthless, immature seeds, enclosed first in the calyx and then in a couple of large green bracts, remains. Occasionally, it is true, fruit is formed, and then one knows that during the few hours' blossoming its partner found it and supplemented and completed its designs.

Now the perfect flower consists of a cup formed by five sepals, the large white trumpet formed by five petals, and, on the narrowing portion of the trumpet, five stamens worthy of special note. The lower part of their filaments is flattened and projects sideways into the corolla tube, cutting it up into pipes, so that if we look down into the flower there appear to be the mouths of five tubes at its base. It is as if one were looking down into the chambers of a revolver. Hence, this is one of the so-called "revolver flowers." In this species of *Convolvulus* this curious formation is particularly marked. The anthers open on the outside. In the centre of all is a circular, flat-based ovary, from which rises a single long column, higher than the

The Hedge Convolvulus

stamens, with two oval stigmas at top. Round the ovary's base are five yellow, fleshy scales, so that it looks like a green egg set in a yellow egg-cup. These scales are the honey glands. There is, however, no scent. Outside the whole flower the two large, green bracts are a noticeable feature, destined to wrap up and to protect the fruit when formed. Indeed, because of the presence of these bracts, the plant is sometimes classed apart from the smaller field convolvulus and called *Calystegia sepium*.

The programme laid down by this flower is as follows. As it opens a hawk moth should be in its vicinity, and, attracted by the honey, it should leave some similar neighbouring flower and hover over this one and finally settle on the projecting, perch-like stigma, incidentally smearing it with pollen brought from the previous flower. Then it should dive down the trumpet-like corolla, and, rubbing on the outside of the anther heads as it does so, insert its long proboscis carefully down one of the "revolver" barrels. At the base is the yellow

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honey-scale, and this it should suck ; then withdraw its proboscis and insert it into the next barrel for a sip at the next honey-sac, and so on. Finally, it should depart to another brilliant, expectant flower, and thus fulfil the plant's mission and satisfy its own honey cravings. But the fact of it is that, in this country, *Sphinx convolvuli* seems somewhat a rarity, so that only occasionally here is this programme carried out. In other countries—Italy, for instance—the moth is much more common, and the plant also ; and one observer tells how he stood over a hedge studded with these flowers watching the moths going in and out and easily catching them by waiting, with thumb and forefinger ready to close, until they had entered the flower and got their probosces safely down a tube. The fruit “sets” there as a matter of course ; but here only now and then, following the rare visitor. Other insects may, and do, occasionally visit it. Bees sometimes dive for the honey, but they seem valueless to the flower ; perhaps they may fail to perch

The Hedge Convolvulus

on the stigma, which is an essential point in the programme. This flower does not close in bad weather, probably because its hours of opening at all are so few ; and though its habit is to close at nightfall, yet on moonlight nights it is persuaded to postpone its folding for, maybe, several hours. The fruit is a single-chambered capsule containing a number of small seeds.

But if the plant rarely sets seed, how is to be explained its abundance in, at any rate, the more southern portions of Great Britain ? The answer is that the thin, goose-quill-like roots are most persistent year after year, and branch abundantly below ground while creeping in every direction, and any little piece seems able to produce a new plant. It is probably through pieces of its roots being carried hither and thither that we find it flourishing in regions so remote from one another as Australia and California, Siberia and Italy, Chili and Great Britain.

Gerard commends the plant because “ it beareth

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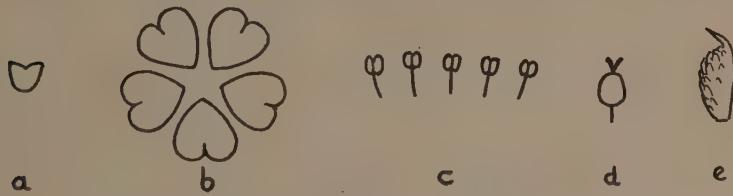
the long branches of a vine, but tenderer, and for the length and great spreading thereof it is very fit to make shadows in arbors"; but he had no opinion of it medically, dismissing it as "an unprofitable weed." Later herbalists, however, prescribe the juices as a drastic medicine; in fact, one asked, "Can it be worth while to import Scammony from Aleppo when a medicine with the very same properties grows spontaneously on many of our hedges?" (Scammony and jalap, medicines still valued, come from foreign members of the same family—namely, the *Convolvulaceæ*.)

Country names for the plant are "Great Withywind," "Hedge Lily," "Our Lady's Nightcap," "Old Man's Nightcap," "Hedge Bell," the "Large Convolvulus," "Great Bindweed," and "Campanelle."

THE HEDGE PARSLEY

CAUCALIS ANTHRISCUS

AT the close of the sixteenth century Gerard was studying the "Bastard Parsleys," and, after describing four different well-known kinds, he found that two yet remained unmentioned, and the



a, sepals. *b*, petals. *c*, stamens. *d*, stigma, ovary. *e*, fruit.

first of these "I have thought good to call Hedge or Field Parsley (because it growes upon hedges and in plowed fields very plentifully everywhere)," he tells us, and the name has remained ever since. The second plant he called the "Knotted Parsley,"

Wild Flowers as They Grow

and it is of interest to us because he specially remarks that it is found growing upon “the banks about St. James and Pickadilla.”

The Hedge Parsley is a neutral personality in the plant world. Just as Gerard in his day found it without any homely name to distinguish it, even though it grew in every hedgeside, so it is with us still, without appeal to the country folk, who pass it daily with indifference. No legends are attached to it, no traditions centre round it. It is difficult to account for this, for flowers of far less beauty are beloved by man. Its lace-like disks of flowers are really charming, and its leaves are some of the daintiest we can find among our native plants. But its family, the *Umbelliferæ*, as a whole, seems lacking in romance, even though it is of great extent and spread nearly all over the globe, and even though, too, its head-quarters lie in those lands of romance, Western Asia and the shores of the Mediterranean. The family traits are very definite, and there is little fear of mistaking any of its members;



HEDGE PARSLEY

The Hedge Parsley

probably it is because the family likeness is so strong, and individuality so lacking, that there is such apparent uninterestingness. Its members are—with the exception of one South European species—all herbs, and are always characterised by a curious Japanese umbrella-like arrangement of their flowers. Each main flower-stalk ends in a ring of shorter, finer stalks, and each of these again in a ring of tiny branchlets, on the end of which is set a single flower like a star. The stalk and stalklets are of such length that the flowers are all brought to the same level and lie forming a disk ; each flower is small and insignificant, but, massed in companies in this way, they cannot fail to be conspicuous and impressive.

The form of the leaves, too, is a definite characteristic of the whole family. With two or three exceptions they are deeply divided and subdivided, so that they are more like fern fronds than ordinary leaves. They are thus of peculiar lightness and grace, but so delicate that they droop and wither hopelessly on being picked.

Wild Flowers as They Grow

This great family of the umbel-bearers is naturally broken up into many genera, but they are not well defined, and often they are only based upon minute and insignificant details in the fruit, most difficult or even impossible to detect by anyone not a microscopist. The subject of our picture belongs to the genus *Caucalis*, which is unusually well defined, and which contains, in addition to the Hedge Parsley, four other plants—namely, the Knotted, Spreading, Small, and Broad *Caucalis*, whose names declare their special character.

The Hedge Parsley is renewed each year from seed. Its stems are thin and wiry, and attain a height of two or perhaps three feet. They are covered with hairs, which are, however, closely pressed down upon the stem surface. The leaf-stalks are triangular, and down the centre of the leaf and along the top of the stalks runs a convenient little gutter for the rain to trickle down to the main stalk and thence to the ground round the root. Each leaf is divided into seven or so leaflets, and

The Hedge Parsley

on each of the stalks this gutter is reproduced in miniature. Thus the plant possesses a very effective system of drainage. Each leaflet is also a leaf in miniature, and divides up into quite midget leaflets, and these in turn are cut up into five segments. Indeed, a leaf of the Hedge Parsley is really a study in dainty fashioning.

The flowers are so small that they must be examined by the aid of a lens if anything definite is to be properly made out about them. In any case, a distinct calyx cannot be detected, for it is united to the ovary wall; but five distinct white petals are attached in a ring round a small, fleshy disk, and they are not quite equal in size, the petals on the outer side being somewhat the larger. For the most part they are white, but sometimes we find groups of flowers suffused with pink. Five stamens radiate between the petals. The two-lobed ovary lies below the petal-ring, but its two receptive columns, short, thick, and fleshy, are above the petals, and it is their bases that unite to form the

Wild Flowers as They Grow

disk already mentioned. This disk oozes with honey, and thus every flower offers freely, on its very surface, sweet nectar to all and sundry of the insect world. But, all the same, it does not seem very successful in its efforts to attract. A German botanist made some careful observations on the visits of insects to various plants of this family, and he found that, whereas one hundred and eighteen different kinds of insects visited the cow-parsnip, or heracleum, one hundred and four visited the common gout-weed, and sixty-one visited the carrot, only nine found their way to our friend the Hedge Parsley. He further watched to see what kind of insects paid these visits, and he noticed that scarcely any butterflies or moths were among them, for honey spread out on a disk is as difficult for them to tackle as it was for the stork to eat off the fox's plate in *Æsop's* fable. But flies and similar insects, which have no long probosces, like their nectar on a flat surface, just as the fox found his platter convenient ; and these were chief visitors. But, in any

The Hedge Parsley

case, the Hedge Parsley does not seem to be any greater favourite with the insect world than it is with the country folk. They do not appear to dislike it, but they simply have no dealings with it, and pass it by unheeding.

Nevertheless, though its stamens are mature before its stigmas, the plant manages its fertilisation by its own resources, together with a little help, and eventually the fruits form, one seed being suspended in each section of the ovary. When ripe, the two sections split apart and fall to the ground. Each is a little brown burr, covered from top to bottom with hooked bristles, which, of course, materially assist in its dispersal far and wide, for they cling to any fur or feathers which happen to come their way. These bristles are a special feature of that particular little group of the family *Umbelliferæ*, in which the Hedge Parsley is classed. Under the bristles there are several ribs, or ridges, running lengthwise, and in the furrows between them lie oil channels known as *vittæ*. In some species the oil is very

Wild Flowers as They Grow

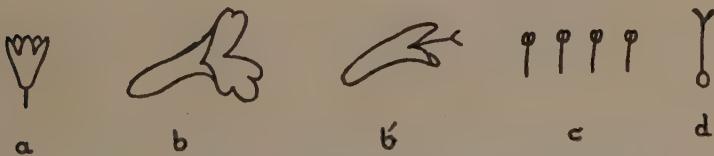
aromatic. For instance, the familiar caraway seeds owe their value for cakes and sweets to the fact that the oil in their vittæ is specially flavoured.

This plant comes into flower about midsummer, and continues right on through the autumn. Straggling branches may even be found in a mild December.

THE MARJORAM

ORIGANUM VULGARE

WHEN foreign spices were unknown, our ancestors had perforce to fall back for savouriness in their dishes upon such of our native plants as were markedly aromatic. And among



a, sepals. b, petals. b', bud opening showing style projecting.
c, stamens. d, stigma, style, ovary.

such the Marjoram stood in the first rank, and was never found wanting in the herb garden of, say, a gentleman of the Middle Ages. Even to-day many culinary recipes include "a sprig of marjoram" among their ingredients, though the suggestion is probably more honoured in the breach

Wild Flowers as They Grow

than in the observance in our commonplace, every-day cooking. So strong is the fragrant balsamic odour of "Sweet Marjoram," that Greek legend—with its usual personification of Nature—tells that once the servant of a great king dropped a vase of rare perfume as he carried it, and, falling into unconsciousness through fright at his mishap, became transformed into this plant, thus gathering up the fragrance that he had spilt. Another legend says that Venus herself raised the plant, and with her touch gave it its scent.

The Marjoram belongs to that group of aromatic plants, thyme, sage, and mint, members of the family *Labiateæ*, which all produce in the tissues of their stems and leaves strong-scented oils of varying nature. And their provision has been of double benefit. In the first place they serve as a line of defence, for browsing animals do not care for their food to be dished up with savoury substances as men do, and pass over these strongly flavoured herbs for less tasty ones ; and, in the second place, since



MARJORAM

The Marjoram

the flavours have appealed to man's taste, the propagation and cultivation of the whole group has been promoted.

The Marjoram is rather a fine plant, with woody, creeping root that sends up tufts of quadrangular stems, which may rise to a couple of feet in height, or even more, by the time it is in flower. The leaves, hairy beneath, a large oval in shape and about an inch long, are in pairs up the stem, but the lower leaves wither and decay in early days. The purple flowers are small individually, but, massed together into compact heads, they make handsome patches of colour in dry hedgerows and thickets and on the chalky hillside pastures, in which the plant specially delights. It is a true touch of nature that makes King Lear use "Sweet Marjoram" as his password for his camp on "the dread summit of this chalky bourne" near Dover. But the chief point of botanical interest is the fact that the Marjoram varies in the kind of flowers it bears. In some plants they are richer in colour

Wild Flowers as They Grow

and larger than in others, and these differences in appearance go with essential differences in character. For the bigger, finer flowers are perfect ones, containing both sets of essential organs—the stamens to fertilise and the ovaries with their seeds to be fertilised; but the smaller, fainter-coloured flowers are incomplete female flowers, only containing the usual four-lobed ovary with one seed in each lobe, but not containing any suggestion of stamens. Of course, these second-named flowers must of necessity be cross-fertilised, but in the perfect flowers this is also provided for by making the stamens discharge their pollen before the stigmas are ready to receive any. Indeed, in no case does it appear that the Marjoram can fertilise itself.

Lord Avebury carefully measured the corollas in these two forms of Marjoram flowers, and he found that, whereas the tube was 7 mm. long in the first, it was only 4.5 mm. in the second. He also found that the imperfect flowers opened some eight days before the adjacent perfect ones. Why this

The Marjoram

should be is a mystery. H. Müller, an eminent German botanist, puts forward an ingenious explanation to account for the imperfect flowers. He points out that, since they are smaller and less attractive than the others, insects would come to them only as a second choice, after exhausting the sweets of the showier plants, and hence they would be fertilised by the pollen the insects bring from those, and therefore it is unnecessary for them to provide any to send on elsewhere. But Lord Avebury's observation of their earlier date of flowering seems at once to render this explanation untenable.

Both sets of flowers are fragrant, and provide honey at the base of the ovary; both have egg-shaped bracts beneath the calyx; both a five-toothed calyx; both a tubular corolla with a suggestion of two lips about it, the upper lip being nearly erect, the lower lip being divided into three spreading lobes and projecting slightly. There are four minute stamens on the showier plants only, but in both is a four-lobed ovary with a column—the

Wild Flowers as They Grow

style—rising from it, which has a forked stigma at its tip. When the flower first opens, the stamens stand out beyond the petal tube; after their pollen has been discharged, the style, up till then short and hidden within the flower, suddenly emerges too, and projects even farther than the stamens. It opens out its stigma as a delicate trap for pollen-laden insects coming for the honey, and there is no doubt that Marjoram is prime favourite with the insect world. On a hot August day a Marjoram bush will seem veritably alive with flies, bees, and spiders, even to the neglect of other more attractive neighbours.

These flowering tops were once used to give a purple dye, but the colour was neither brilliant nor durable. Before hops were known in brewing, they were put into beer to flavour it and make it “keep”; and they were also thought to make it more intoxicating. The flowers are in bloom during July and August, and our forefathers, lacking the foreign perfumes of to-day, used to gather spikes of the

The Marjoram

plant for the sake of their scent. "The sweete Margeromes," says Parkinson, "are not only much used to please the outward senses in nosegaies, and in the windowes of houses, as also in swete powders, swete bags, and swete washing waters, but are also of much use in physicke, to comfort the outward members and parts of the bodie, and the inward also." And, indeed, its reputation in medicine led to many quaint usages in olden days. "It remedieth the bighting and eating of spiders," says one ; "the oyle of Margerome heals the wearinesse and the dead palsie, and dropped into the ears it healeth the bitings of venemous beasts," says a second ; while a third, among many other things, announces, "these plants are easie to be taken in potions, and therefore to good purpose they may be used and ministered unto such as cannot brooke their meate and to such as have a sowre, squamish, and watery stomacke." Finally, it was generally credited with being a sovereign cure for toothache.

In addition to "Marjoram" (with variations in

Wild Flowers as They Grow

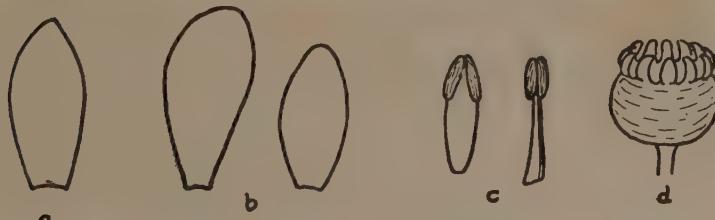
spelling to suit individual tastes), the plant has been popularly known as "Origane," "Organie," "Organy," "Organ," all derivatives from its Latin name *Origanum*. It is even surmised that the name Marjoram, otherwise inexplicable, is a far-fetched derivative from the same. *Origanum* itself is from the Greek, and has the poetical meaning of "joy of the mountain."

One further point remains to be mentioned, and that is its association with the happy dead: if Marjoram flourishes on a grave, then he who lies beneath rests in peace.

THE WHITE WATER LILY

NYMPHÆA LUTEA

THIS "Queen of Still Waters" has been judged our largest and perhaps finest wild flower by no less an authority than Lord Avebury. Without a doubt it is our stateliest, with its suggestion of



a, sepals. *b*, petals. *c*, stamens. *d*, Ovary with crown of stigmas.

statuary, for its beauty lies rather in its purity of form than in any feast of colour—a fact that the poets have always recognised.

"Thou sculpture-like and stately river queen,"

says one,

Wild Flowers as They Grow

“ Those milk-white cups with a golden core
Like marble lamps,”

says another.

The roots, creeping in the mud at the bottom of lake or quiet, slow-moving stream, anchor the plant, and up through the water in the springtime thick, fleshy stems carry coiled leaves. For, for their little voyage, these are rolled on their face from margin to midrib in two coils, and not until they have reached the surface do the tight rolls unfurl and spread, face upturned to the sky, paving, as it were, the surface of the water with green, rounded areas. The circular outline of each leaf is unbroken except at the point where the stem is attached, and there it is deeply cut into two lobes. But, simple as the leaves look, there are four special points of interest about them. It is obvious that since the opposite sides of the leaf are in this case living under totally different conditions—one in air and the other in water—they must needs be fashioned differently to

WHITE WATER LILY



The White Water Lily

suit their environment. In the first place, then, those microscopic stop-tap organs, the stomata, which in leaves regulate the transpiration (a process analogous to our perspiration), are only found on the upper surface, though usually they are chiefly on the under side of leaves. Naturally, they would be useless under water, but on the top side they are so lavishly provided that it is calculated there are over eleven millions of them on a single leaf. Again, since the leaves are flat and rain might easily collect upon them and stultify the work even of this immense host, the plant takes the precaution to wax the surface on which they lie, so that moisture cannot "wet" it, but immediately collects into drops. And, because the leaf is slightly raised where the stem joins it underneath, these drops promptly trickle towards the edge. But there again the plant provides for contingencies, for the edge is waved a little, and at the least rocking of the leaves by the water, the drops promptly fall over into the main stream.

Wild Flowers as They Grow

Now this waving of the edge has one very curious and unexpected effect. When the sun is high in the heavens, shadows of the leaves will be thrown on the bottom of the pool; they can be especially well seen in a large fountain basin or on the pale, gravelly bed of a clear stream. But, to our amazement, instead of these shadows being of the form we should imagine, each is striped in the most peculiar manner, alternating dark and light stripes radiating from a dark core. And as one looks from them to the leaves, one is perplexed to find a reason for this surprising divergence between shadow and object. Kerner, however, offers an explanation: "The cause of this peculiar form of shadow is to be found in the undulating margin of the floating leaves. The water of the lake adheres to the whole of the under surface of the disk as far as the edge, and is drawn up by capillarity to the arched portions of the undulating margin. The sun's rays are refracted as through a lens by this raised water, and so a light stripe corresponding to

The White Water Lily

each convex division of the curved margin is formed on the bed of the lake, and a dark stripe corresponding to each concave part. These are arranged in a radiating manner round the dark central portion of the shadow." Finally, the under side of the leaf is often of a purplish hue, due to a pigment known as anthocyanine, which changes light rays into heat rays, and helps to keep the leaf warm, and thus assist the processes that go on within it.

We pass from the interesting leaf to the even more interesting flower. A century ago Goethe, poet and scientist, enunciated the principle that every part of a flower is fundamentally a modified leaf, and of the inherent truth of this assertion the Water Lily flower is an admirable illustration, for here, set in a close spiral on a fleshy disk, are a series of parts which graduate one into another, typical green sepals passing into greenish-white sepal-petals ; then pure white petals, forming the chalice of silver white ; these give way to smaller parts

Wild Flowers as They Grow

with two yellow thickenings at top, which gradually, on succeeding parts, become more emphasised, until they appear as ordinary anthers set on a wide white petaloid stalk. Finally, we come to stamens of the ordinary type standing in a ring round the great urn-like seed-capsule. This capsule is divided into many chambers—fifteen to twenty—and contains very many seeds. On the top, one for each chamber, is a ring, just like a crown, of short, thick processes—the stigmas. It is no wonder that the rosette-like flower, with its suggestion of “doubling,” was commonly known by our forefathers as the “Water Rose.”

The flowers float among the leaves, solitary, on long stems; every morning they open, and toward evening they close. It used to be generally believed that they also withdrew under the surface and spent their nights immersed. Tennyson has this belief in mind when he says in “Maud” :—

“The white lake-blossoms fell into the lake
As the pimpernel dozed on the lea.”

The White Water Lily

And Leigh Hunt still more definitely speaks of—

“ Those virgin lilies all the night
 Bathing their beauties in the lake,
That they may rise more fresh and bright,
 When their beloved sun’s awake.”

But the truth is, not that they sink, but that, as they close and the green sepals wrap over the white petals, they merge in the dusk in the greenness of the leaves and become practically invisible. In wet weather they close also in the daytime to protect their pollen.

There is no scent in our English White Water Lily, and nothing that we can really call honey, though a little watery liquid oozes from the stigmas ; but, indeed, the plant seems to depend little upon the visits of insects ; occasional beetles, and perhaps a chance fly or two, seem to bring about such rare cross-fertilisations as do happen. As a rule the stamens bend over the stigmas before the flower fades, and their pollen falls upon them and fertilises the seeds. If one of these pollen grains be looked

Wild Flowers as They Grow

at under the microscope it will be seen to have its whole surface studded over with minute warts. Sometimes the flower opens a day before the stamens are mature, and during this time self-fertilisation is impossible and cross-fertilisation may happen. The fruit is globular and slightly pulpy, and ripens under the water. The "blackish glittering seed" is dispersed by the movement of the water.

"Bobbins," the old Scotch name for the plant, is probably derived from the shape of the seed vessel, though some think it is from the bobbing of the flowers as the water moves.

Various legends have centred round this plant. Once it was a nymph who pined away for love of Hercules. The Wallachians say that all flowers have souls, and that the sinless soul of the pure white Water Lily blossoms at the Gate of Paradise and judges the rest. There is a common Dutch superstition that if one stumble as one carries a Water Lily one will develop epilepsy.

The Water Lilies, both white and yellow (the

The White Water Lily

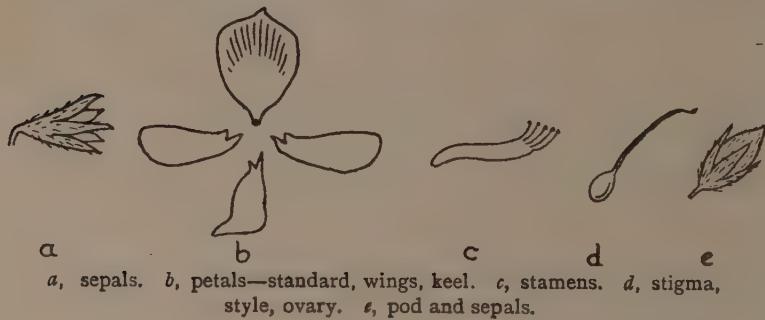
yellow belong to a different genus, though of the same family, the *Nymphaeaceæ*), are flowers of midsummer, and it is in the heat of July days that—

“The water-lily to the light
Her chalice rears of silver-white.”

THE REST HARROW

ONONIS ARVENSIS

THE Rest Harrow is the reproach of the farmer. Its presence tells its own tale, for it speaks of poor, uncleaned land and untended barrenness. Its



appearance, however, does not tally with its reputation. A low, creeping shrub, its brown stems are clothed with small, oval, stalkless leaves, over which is thrown a veil of soft spreading hairs. The leaf



REST HARROW

The Rest Harrow

Margins are notched into a saw-like pattern, and a glistening suggestion of viscosity lies in their tissues. Here and there a sharp thorn thrusts itself beyond them. But the plant is redeemed for beauty by its large, single, rose-red flowers, that make charming touches of colour on the close-set branches. They, like the leaves, are stalkless, and it is almost as though rosy sweet peas from the garden had been scattered over the plant. As for its roots, black without, white within, every farmer knows their shrubby nature, and how hard and strong and long they are; how difficult to cut through when green and fresh, and how still more difficult to deal with when they are dry and hard as horn. It is from them that the plant is sometimes called "Sidfast" or "Sitfast," or "Stay-plough," because they so much obstruct the plough as it cuts up the land. The name, Rest Harrow, refers to the obstruction offered by the creeping branches above ground, either by stopping the harrow or by "wresting" it from its due course. This determined obstructiveness

Wild Flowers as They Grow

both above and below has caused it to be taken as the very emblem of "obstacle."

It is a plant of many native names. Since country children often suck pieces of the root for a certain sweet liquorice juice they contain, it is known as "Wild Liquorice" or "Spanish Root," and because it is prickly and creeping like the whin, though on a smaller scale, it is called "Lady Whin," "Cat Whin," "Petty Whin," or "Ground Furze." "Horse's Breath," a ploughboy's name for it, perhaps refers to the animals' harder breathing as they endeavour to plough through it. "Cammock" is a very old name still in use and difficult to explain. "Chamock" is a variation of it. "Lewle," "Ransey," "Rassels," "Rastylbow," "Bomariskie," and "Stainch" need etymological research to account for them. The Latin name of the Rest Harrow—*Ononis*—has a very prosaic origin from the Greek word for an ass, presumably because, as with thistles, only an ass can, and will, eat it.

The pretty rosy flower is of the pea-type, for

The Rest Harrow

the plant belongs to the same family, the *Leguminosæ*. It has a small, five-pointed calyx; five large petals, namely, a pair of paler pink ones uniting to form a closed keel, which has, however, a minute orifice at its extreme tip, a pair called "wings"—one on either side of the flower, and converging so that their upper margins form a sort of saddle—and one large, upstanding petal, the standard, of a richer, deeper hue than the others. The ten stamens are all united into a tube; we say they are in "one brotherhood." In this family frequently one stamen is detached from the others and a narrow slit is then left all the way down in the stamen-tube, the purpose of this being to leave an opening through which insects can get at the honey within. But the Rest Harrow, like the broom and a few other plants, produces no honey in spite of all its attractiveness, so there is no object in leaving any sort of a slit to suggest that there is. Nevertheless, it is remarkable how the flower seems to deceive bees. Again and again the German botanist, Müller, watched

Wild Flowers as They Grow

them alight on the flower and probe for honey; the male bees—the drones—finding none, could only fly away in disgust, their labour lost; but the female bees—the workers—at once turned their attention to the pollen, which is plentifully produced, especially by the innermost stamens, and thus they got something for their pains. It is happy for the plant that generation after generation of bees do not seem to learn its honeyless condition by experience, since bees are absolutely necessary to its fertilisation.

The construction of the flower is rather an ingenious piece of piston mechanism. The keel is interlocked with each wing by a fold of the wing fitting into a socket on the keel (see the shape of keel and wings in the diagram). Therefore any pressure on the wings is immediately transmitted to the keel. Now inside the keel the stamens lie, their anthers towards its point. Below the anthers the filaments are thickened into clubs, those of the outer stamens being firmer and thicker than the inner ones. When ripe the anthers pour out their

The Rest Harrow

pollen, and it lies in the cone-shaped hollow formed by the extreme tip of the keel. All is now prepared, the Rest Harrow can do no more until its bee-guest appears. The petals are at their vividest, though they give out no scent, and the bee surely comes and, poising above the blossoms, suddenly settles on the saddle of the wings. These give under its weight, the keel is dragged sharply down with them, the stamens act as a piston, and some of the pollen lying above them is pressed out through the orifice at the tip in a little sudden explosion. It shoots on to the bee still straddling the flower, and lodges on its abdomen. Directly the bee flies away the parts of the flower all resume their original position, and with a second visitor the same process is repeated. Finally all the loose pollen will have been pumped out and carried off, and then, as the keel has become by this time more yielding, the ovary column (now grown longer) will shoot through the orifice and strike on the pollen-dusty abdomen of the visiting bee. It gets smeared with the pollen thereon, for

Wild Flowers as They Grow

the pollen from previous flowers was deposited on that identical spot, and thus fertilisation is effected. The fruit is in the form of a pod, but it only contains two or three seeds.

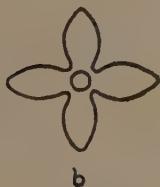
Mention has already been made of the thorns of the Rest Harrow. It is a curious fact that the dryer and more barren the soil, the more thorns does the plant bear. In garden or in richer soil the plant becomes "tamed," as Linnæus called it, and loses its aggressiveness. This is because the thorns are, in their origin, starved buds that have aborted. Supply the full meed of nutriment, and the buds—the potential thorns—become leaf and flower-bearing branches.

Two species of Rest Harrow are natives of Great Britain—i.e. the subject of our sketch, a perennial, which is hairy and armed according to its environment, and tends to vary considerably in the degree in which it creeps; and the Small Ononis, an annual (*Ononis reclinata*), which is a midget reproduction of the first-named, and only very rarely met with.

THE CROSS-WORT

GALIUM CRUCIATA

NOT every man is born to distinction, nor is every plant born to prominence. In the realms of both man and plant a background of the undistinguished is necessary for the vivid to out-



b



c



d



e

b, petals. c, stamens. d, stigma, style, ovary. e, fruit.

stand. And in the plant before us we have one of the average—not without charm and not without interest, but without that indefinable personality that insists on special recognition. But one cannot always deal with the pre-eminent, and so,

Wild Flowers as They Grow

for a moment or two, we turn to notice the Cross-wort. It is one of the *Stellatæ* tribe, the only branch of the great *Rubiaceæ* family which is known in Great Britain, or, indeed, in all Europe. As a class the *Rubiaceæ* live in the tropics—they are the gardenias, the manettias, the bouvardias of our greenhouses ; while the *Stellatæ* tribe—the woodruffs, the bedstraws, and wild madder—are their representatives in the temperate zone.

The Cross-wort is a plant of the hedge-side and thicket, with square, hairy stems, which appear year after year, grow to one or even two feet in height, and die down in the autumn. They are divided into tiers, marked off at regular intervals by crosses formed of four green oval leaves which are stalkless. It is to these crosses that the plant owes its second name of *cruciata*. Now the botanist has a theory about these leaf crosses. There ought to be, by rights, he asserts, two leaves proper, opposite to each other on the stem, and each of these leaves should possess two little leaf structures, known



CROSS-WORT

The Cross-wort

as stipules, at its base—that is, four stipules to each pair of leaves. But, during the course of ages, the adjacent stipules, one from each leaf, have coalesced and developed on precisely the same lines as the leaves, so that they are now indistinguishable from them in appearance, and we speak of the whole set as four leaves. They, like the stem, are covered with long, spreading hairs.

In the higher tiers of leaf-crosses are close groups of tiny flowers, the main stem of each cluster being too short to carry them beyond the leaves, and each flower looks like a tiny yellow cross. Now the ten species of *Galium* we have in our flora form a very well marked off group, but the Cross-wort can be at once singled out from among them because it alone has both yellow flowers and four cross-like leaves. Thus the lady's bedstraw (*Galium verum*) has also yellow flowers, but its leaves are in rings of six or eight, while all the other *Galiums* have white flowers.

The dainty flower-clusters hold a surprise for us.

Wild Flowers as They Grow

All the tiny flowers look precisely alike, but their appearance belies them, for only some of them are perfect flowers with stamens and an ovary; others, not to be told at a glance, contain nothing but stamens. And it is curious that even those botanists who have most carefully studied this plant, are not in complete agreement as to the way in which these two kinds of flowers are produced. Darwin thought that, as a rule, the lower tiers are composed of incomplete male flowers—i.e. with stamens only—and the upper tiers chiefly of perfect flowers; but a German botanist—Schulz—disagrees. The first flowers that form are the complete ones, he says; it is the later ones that are incomplete and have stamens only. It is difficult in such minute flowers, where the internal arrangements are necessarily still more minute, to be always quite positive in these matters. Anyway, two facts stand out. First, that there are both perfect and imperfect flowers on the same stem, and secondly, that the perfect flowers are distinctly in the minority. The imperfect

The Cross-wort

flowers have much the shorter life, though, and quickly disappear, and then only their turned-back stalks remain to speak of their one-time existence.

The Cross-wort begins flowering in May, and it is then really attractive in a non-exciting way. A perfect flower is made up as follows. First, there is a practically imperceptible calyx united to the ovary wall; then there are four petals, cross-wise, whose lower portions are supposed to be united into a tube, but this too is almost imperceptible, so minute is it. Four stamens, of size to match, alternate with the petals; and on the ovary, which lies beneath the petal tube, rises a style with two stigmas. The stamens ripen and discharge their pollen before the stigma stretches out its branches to receive it. The imperfect flowers are on precisely the same plan, only the ovary with its stigmas and style is missing. Honey lies in both kinds of flowers; of course, in such a tiny blossom it can only be in very minute quantities, but it is sufficient to appeal to many insects, big and little; beetles in

Wild Flowers as They Grow

particular seem to appreciate it. (It is strange how flowers of yellow hue generally seem to appeal to beetles.) All the various insect visitors, as they crawl over the flower clusters, carry the pollen about on their legs, and since some of the flowers are male only, while in the others there is a period of time when the stamens are mature and the stigma is not, it follows that there is a considerable ratio of chance that cross-fertilisation will take place.

But even the flower-lover, who is casually attracted by the delicacy of the Cross-wort's alternating tiers of yellow and green by the hedgeside, does not, as a rule, know it in its later fruiting stage, and perhaps naturally, for the fruit is quite insignificant —just a dry, smooth, tiny object, which proves, under careful examination through a lens, to consist of two chambers with a seed in each.

Besides the name Cross-wort (wort being of course, derived from the Anglo-Saxon word meaning a plant), this plant is known as "May-wort"—a May flower—and also by the ugly name of "Mug-weed."

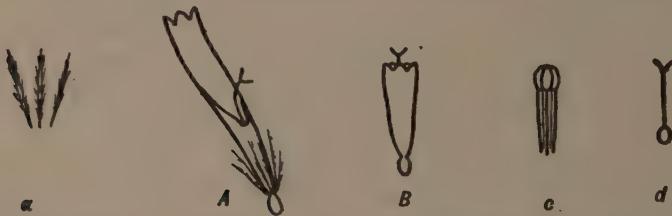
The Cross-wort

In old books we sometimes find it spoken of as “the Golden Mug-weet.” The following vivid description was written of this plant more than three hundred years ago, and it may be of interest to us to-day for its quaintness : “ Crosse-wort is a low and base herbe, of a pale greene colour, having many square, feeble, rough stalks full of joynts or knees, couered ouer with a soft downe ; the leaves are little, short, and small, alwaies foure growing together and standing crosswise, one right against another, making a right Burgunion crosse ; towards the top of the stalk, and from the bosome of those leaves, come forth very many small yellow floures, of a reasonable good savour, each of which is also shaped like a Burgunion crosse. . . . Crosse-wort hath an excellent property, to heale, joyne and close wounds together ; yea, it is very fit for them . . . the herbe being boyled untill it be soft and laied upon the bursten place in manner of a pultis.”

THE FLEABANE

INULA DYSENTERICA

THIS rather ugly plant, with its distinctly ugly name—albeit there is in it a suggestion of comfort under certain adverse circumstances—grows in ditches and damp places through summer and



A, ray floret. *B*, disk floret. *c*, calyx hairs. *c*, stamens (disk floret). *d*, stigma, style, ovary (both florets).

autumn. Fairly common in the south, it becomes less so as we go north, and it forms one of that vast horde of composite flowers that "love the roadside, because here they are comparatively safe, and, ragged and dusty, like the common tramps



FLEABANE

The Fleabane

that they are, form one of the characteristic features of early fall." * How exactly it lives up to its name is not very clear. We have it on quite good authority that its mere odour is so unpleasing to little flies of all sorts, and fleas in particular, that they at once hasten to quit its vicinity; while other equally good authorities state that it is only the smoke from the burning plant that is abhorrent to these minor pests of mankind. Probably our forefathers were better able to pronounce judgment on this point than are we in these more sanitary and cleanlier times.

It is a rough-looking plant, a foot or two high, whose loosely branching, woolly stems carry still more woolly leaves. Indeed, the whole plant, even the green bracts beneath each flower-head, is covered with these grey-green hairs. Though it always chooses a home where plenty of moisture is obtainable, it yet takes the precaution to invest itself in this thick garment to prevent evaporation from its

* John Burroughs.

Wild Flowers as They Grow

tissues. The narrow, pointed leaves are not only sessile—that, is, set close down, stalkless, upon the stems—but they have two long ears—auricles, in botanical parlance—which clasp the stem and project beyond it on the side opposite to the blade. The sap that lies in the tissues is bitter, astringent, and slightly salt, so that animals will not eat the plant. In England it has never had much reputation as a medicinal agent, but abroad it has ranked very high in the estimation of doctors and herbalists. Its second botanical name suggests one disease in which it is useful ; indeed, that name was given to it by Linnaeus because he had been told by General Keit, of the Russian army, that his men, when marching against the Persians, cured themselves of dysentery by means of this plant. The Arabs pin their faith to it in many matters, but chiefly for its reputation to cure wounds and sores. They call it “Job’s Tears,” for even the Patriarch Job, they say, applied it to his boils and obtained relief.

The Fleabane belongs, as is obvious at a glance,

The Fleabane

to that enormous family the *Compositæ*, which gives us the daisies and dandelions. Its bright yellow blooms are about three-quarters of an inch across, and remind us much of a daisy, only they are wholly yellow—yellow rays as well as yellow disk. At the back of the bloom is the involucre of very narrow pale-green bracts. Then comes a ring of very narrow ray florets, about one hundred in all, and then, tightly packed in rings on the disk, some six hundred tubular florets, in all stages of development. Seven hundred flowers crowded into one small bloom no bigger than a shilling is no mean feat of Nature's floral mechanism. Pull away carefully two or three rays. Each is very long and slender, and composed of several tiers. At the bottom is the little green ovary, then a ring of hairs, then a yellow tube out of which a fork is peeping like a man in a pulpit, and at the back of it is the long, yellow, narrow ray notched at the top. If we split the tube down we find nothing inside except the long, thin column that unites the fork to the ovary.

Wild Flowers as They Grow

Therefore, these ray-florets are purely female flowers.

Turn to the disk florets and pick out carefully with a pin two or three in the outermost rows. Here again is a little green ovary crowned with a ring of hairs and with a tube—though a rayless one—standing on it. But inside this tube, in addition to the stigma fork and the ovary column, is a ring of stamens, heads all joined, filaments distinct. One curious point about these stamens is that each anther has two little tails, the use of which we cannot see. They are not, however, shown in our diagram at the head of the chapter because they are so extremely minute that it is no use attempting to see them with the naked eye. Thus the disk florets are perfect flowers—male and female in one.

Now, in all composite blooms, the outermost florets mature first, and then the inner ones in orderly succession to the centre; the ray florets have their forked stigmas showing two or three days before the tubular florets in the outermost

The Fleabane

row open. Therefore, in the very earliest blooms of a Fleabane, if fertilisation is to take place at all, it can only be through pollen being brought to it by insects from some earlier flowering and allied species. This, of course, makes for hybridisation. Kerner points out that "in the floral region of the Black Sea many Fleabanes grow side by side (*Inula* *Oculus-Christi*, *ensifolia*, *Germanica*, *salicina*, etc.), and in the summer they blossom in definite succession, so that one species always begins to fade when another is in its prime . . . and for each species there is a certain period, if only two days, when the pollen brought by insects to the stigmas of the pistillate (female) flowers on the circumference can only have been obtained from another species, since their own pollen is not obtainable." Therefore, at the commencement of flowering there is always a great chance of the seed then fertilised producing hybrid plants. After this period we have legitimate crossing between flowers of the same species and probably between flowers of the same bloom.

Wild Flowers as They Grow

Cross-fertilisation takes place in this way. In the tubular disk florets the stamens ripen first ; their anthers open on the inside, and their pollen falls out into the tunnel formed by their united heads. It lies, a floury mass, on the top of the closed stigma. The ovary column next grows rapidly, and pushes up the pollen, so that finally it lies at the very mouth of the tube and is brushed by insects, or tipped on to outer, adjacent florets, where the stigma of each is standing opened and expectant. Meanwhile—next day—the stigma on the top of our growing column opens out and lies fresh and waiting in its turn for pollen from its neighbours on the inside. Thus, the inner ring of florets from the very centre outwards always fertilise the rings that lie outside them. It is impossible for fertilisation to work from outwards inwards, because the rings within are only half-opened buds at the moment when pollen is being pushed out of any one ring of florets, and their stigmas are still lying closed low down in the tubes.

The Fleabane

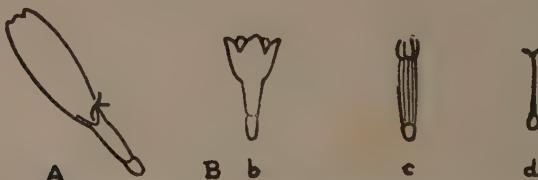
The fruit that forms in each floret consists of a little dry, oval seed crowned with a brush of hairs three or four times the seed's length. The Fleabane looks to the wind to disperse its seeds and to prevent overcrowding, and this elementary form of parachute is the plant's effort to utilise the wind as a carrier.

At one time the Fleabane and the Small Fleabane formed a little class to themselves under the generic name of *Pulicaria* (Latin, *Pulex*, a flea), but now they are classed with our four native *Inulas*—namely, the elecampane (*I. helenium*), the golden samphire (*I. crithmoides*), the willow-leaved inula (*I. salicina*), and the ploughman's spikenard (*I. conyzoides*).

THE CHAMOMILE

ANTHEMIS VULGARIS

“THE good, capped sister, with a thousand smiles, bringing the health-giving brew in an earthenware bowl” is Maeterlinck’s personification of the Chamomile, and it is true that the



A, outer ray floret. *B b*, petals of tubular floret. *c*, stamens of tubular floret. *d*, stigma, style, ovary of both florets.

name invariably conjures up visions of homely doctoring—nauseous drinks and grateful poultices—for the medical fame of Chamomile has been handed down from time immemorial to the present day. Indeed, those who have seriously tried



CHAMOMILE

The Chamomile

it, even in these days of incredulity, do not lightly have their faith in its merits shaken. No plant was better known to the country folk of old; in fact, so well known was it that all the old herbals agree that "it is but lost time and labour to describe it." Its Latin name, *Anthemis*, emphasises this point too, for it signifies flower, as if this were *the* flower for all the world. The Egyptians specially reverenced it for its virtues, and dedicated it to their gods. That old cynic, Culpepper, is scathing on this point. "Nechessor saith," he remarks (Nechessor was an Egyptian), "the Egyptians dedicated it to the Sun, because it cured agues, and they were like enough to do it, for they were the arrantest apes in their religion that I ever read of." Nevertheless, Culpepper himself gives a long list of aches and griefs in which it is "profitable," from agues and sprains to jaundice and dropsy, descending even to such details as that "the flowers boiled in lye are good to wash the head." And Parkinson, a contemporary of his, in

Wild Flowers as They Grow

his "Earthly Paradise" (1656), writes, "Camomil is put to divers and sundry uses, both for pleasure and profit, . . . both for the sick and the sound, in bathing to comfort and strengthen the sound, and to ease pains in the diseased." Our great grandmothers appear to have had such a passion for Chamomile tea in all their migraines that Dr. Thornton, a distinguished physician a hundred years ago, solemnly warned them that "although this be a fine remedy and merits all our praise, still it must be remembered that as the cord, too tightly strung, relaxes its tone so as never to recover again, thus the stomach, too much braced by a long-continued use of camomile tea, loses irrecoverably its tone, and becomes a truly afflicting evil arising from imprudent use of this tonic."

The Chamomile is a low-growing plant, creeping or trailing, its tufts of leaves and flowers perhaps a foot high. It prefers dry commons and sandy soil, and when walked on its strong fragrant scent will often reveal its presence before it is seen. For this

The Chamomile

reason it has been purposely planted in green walks in gardens. Indeed, walking over the plant seems specially beneficial to it if one may trust an old rhyme, which runs—

“ Like a camomile bed—
The more it is trodden
The more it will spread.”

Falstaff, in *Henry IV.*, moralised from this: “ Though the camomile the more it is trodden on the faster it grows, yet youth the more it is wasted the sooner it wears.” The stems, hairy and freely branching, are covered with leaves which are divided into thread-like segments. The fineness of these segments gives the whole plant a feathery appearance. The blooms appear in the later days of summer.

“ Lammas Daie called August’s Wheel,
When the long corn smells of cammomile,”

is the date given in the old Church Calendar of English flowers, “ Lammas Daie ” being August 1st. These blooms are borne solitary on long stalks, and

Wild Flowers as They Grow

with their white rays and yellow centres are remarkably like the daisy. Both, of course, are members of the same family, the *Compositæ*, but the family likeness is peculiarly strong in their case. There are some eighteen white rays arranged round a conical centre—the centre of the daisy is considerably flatter than that of the Chamomile. Each white ray is a female flower specially designed to attract; near its base it is curled round into a tube, out of which can be seen peeping the forked receptive column that communicates with the ovary hidden at the very bottom. The upper expanded part is at least five or six times the length of the minute tube.

On the conical hill in the centre are set ring after ring of minute perfect flowers, where the corollas are yellow, not white, and where the petals form a symmetrical tube. Wee as the tube is, it yet manages to contain five stamens which have five distinct filaments—though their heads have become joined together during the pressure of ages—and

The Chamomile

also an ovary with a style running up through the stamens. How the fertilisation has been effected has already been described in the previous chapter, for it is a close relative of the fleabane, and both manage this matter in the same fashion. But there is another distinction between the fleabane and the Chamomile beyond the rather accidental quality that the rays of the fleabane are yellow and those of the Chamomile are white, and that is, the curious feature that all the Chamomiles have a tiny chaffy scale between each two florets. This scale is very minute and has to be carefully looked for, but it is a vital characteristic all the same. Small flies are the chief visitors that frequent both flowers. The fruit is small, brown, and dry, and, as it forms, the hill of the receptacle gets more and more conical.

There are a large number of species of Chamomile which are spread over Europe, North Africa, and the temperate region of Asia, but in Great Britain we have only four growing wild. First, our own sweet-scented true Chamomile; second, the Fœtid

Wild Flowers as They Grow

Chamomile or "Stink Mayweed," which has what Gerard calls a "naughty smell"; third, the Corn Chamomile, which flowers rather earlier and is noticeable because its ray florets are empty and wholly for show, and possess no sort of ovary or style; fourth, the Yellow Chamomile, with yellow instead of white rays, which is found sometimes on ballast heaps, but which is certainly not a true native. Another plant (*Matricaria Chamomilla*) is sometimes called Wild Chamomile, and it is so remarkably like the Corn Chamomile that it is often difficult to distinguish it from that plant; but botanists will not allow it to rank among the true Chamomiles because it cannot show those quaint little chaffy bracts between its florets. It has a strong smell, however, which the Corn Chamomile has not.

The Chamomile is purposely grown for commercial purposes, chiefly about Mitcham, and the blooms are dried and then sold by chemists. They are particularly rich in that aromatic substance that gives the plant its peculiar smell and taste. One might

The Chamomile

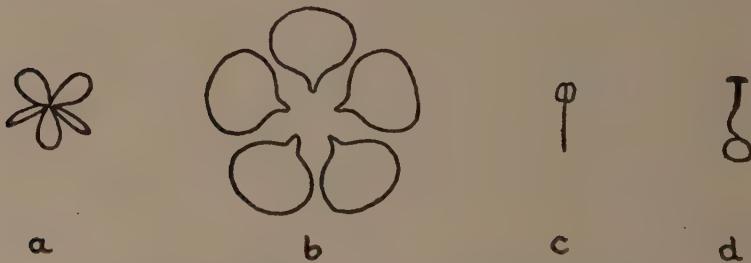
invert the saying of “the bark being worse than the bite” here, for the aromatic fragrance, which appeals from a distance to our senses, gives no hint of the bitterness of its actual touch in taste when we are brought into close quarters with it.

The Germans have a quaint superstition that the Chamomile plants were once soldiers who for their sins have been accursed, and they are called *Heer männchen* (little warriors) in consequence.

THE ROCK-ROSE

HELIANTHEMUM VULGARE

SENSITIVE to a degree, the golden flower of the Rock-Rose only attempts to face the world for one short day at most, and even during these few hours of its blossoming will not unfold



a, sepals. *b*, petals. *c*, stamen. *d*, stigma, style, ovary.

its delicate petals unless the sun be shining. Well is it called *Helianthemum*, "flower of the sun," anglicised sometimes into "Sun flower" or "Sol-flower," or even "Sun Daisy" and "Sun Rose," though it is neither daisy nor rose. To see it at



ROCK-ROSE

The Rock-Rose

its best one must stop in July or August by some dry bank, chalky for preference, over which the little shrub is trailing its branches, and then in the bright sunshine it will be found thickly studding the many twigs with large, wide-open blossoms of much beauty. The flowers are sometimes said to be reminiscent of a buttercup, and perhaps they are in general outline, but they are larger and their petals look as though they had been fashioned out of crumpled tissue paper rather than out of a burnished sheet, and where the buttercup is sturdy and brazen the Rock-Rose is shrinking and fragile, and without any "shine" on its petals. The crumpled look is due to the way in which the petals are folded up in the bud, for there, instead of being neatly pleated or rolled, they are—to quote an old writer's succinct description—"cramb'd up within the Empalement (i.e. calyx) by hundreds of little Wrinkles or Puckles; as if Three or Four fine Cambrick Handkerchiefs were thrust into one's Pocket." And they never get properly smoothed

Wild Flowers as They Grow

out afterwards. (The poppy has a similar untidy fashion of crumpling its petals in the bud.)

The flower buds of the Rock-Rose always hang down in a very limp sort of way until they open, and then the cup-like flower is held facing the sun. Though the flower, as a whole, is regular in form, yet the sepals are irregular in that the outermost two of the five are merely little slips of things ; the inner three are much larger and of a scaly, semi-transparent texture, marked by three strong coloured ribs. All are somewhat hairy, and persist protectingly round the fruit after the petals have fallen. These also are five in number, and are heart-shaped. The many stamens stand like crowded ninepins in a ring round the ovary, sloping a little away from it, and they are slightly joined together at the base. It is suggested that originally there were only a few stamens—say five—and that the many have been formed through the five branching. But, though they are ordinary enough to look at, they are of peculiar interest, for they are among those

The Rock-Rose

rare organs in plant life that are sensitive—"irritable," is the botanist's word—and if touched in a certain way they will slowly fall back over the petals. A few years ago Professor Haberlandt, investigating the subject of sensation in plants, made a special study of these very stamens. He found that they were not sensitive all over, but that the sensitive spot was at their base on the outer side. Touched there with a stiff hair, they sank backwards away from the ovary; touched on the inner side, they showed no response and remained erect. One can try this experiment for oneself with a pin. No doubt it is because they are irritable at one place and not at another that such conflicting statements have been made as to their general sensitiveness. Let us see, then, how this curious power affects the plant's welfare.

Now round between the stamens and the corolla is a fleshy pad covered with minute hairs; one would imagine that it would contain honey, but it does not do so—there is no honey in a Rock-

Wild Flowers as They Grow

Rose. However, many a little wasp comes seeking it there, and rummages round outside the stamen ring. It must needs touch on the sensitive bases of the stamens, and they promptly fall back and press their pollen on the wasp's body, and it flies away with a load. When a honey bee comes she settles at once on the tops of the tufts of stamens, her legs bending them beneath her. Now as the style is longer than the stamens, it is most likely she will knock her head on it, and thus probably cross-fertilise it ; but, if not, her movements over the flower will at least smear it with the pollen abounding all round. She is wise, too, and makes no attempt to find honey where there is none, but simply collects pollen. It must be noticed that all the flowers that offer pollen instead of honey to their visitors agree in having cup-like flowers, so that when the anthers discharge their pollen it is collected in the cup and not lost. Bees, both wild and hive, seek for pollen in large quantities to carry it as food to their larvæ, and they are furnished with specially

The Rock-Rose

constructed hairs and bristles, like little feathers, to enable them to do this. The pollen clings to these "feathers," and is carried away on them, to be removed later when the bee gets home. Little beetles are also great visitors of the Rock-Rose, particularly beetles of the *Anthobium*, *Dasytes*, and *Meligethes* genera ; " and it is no uncommon thing to find in a single cistus or Rock-Rose half a dozen *Dasytes* greedily devouring the pollen," says Kerner.

Another explanation, sometimes put forward, of the sensitive stamens, is that they fall away from the ovary directly an insect alights on them, to prevent, if possible, self-fertilisation ; but it is difficult to accept this view now that Prof. Haberlandt has so definitely shown that only the outer base of the stamens is irritable. For the explanation to hold water the inner, upper part should have been the sensitive area. In this flower stamens and stigma are mature together. The single ovary ripens into a capsule opening by three valves to allow the many seeds to escape.

Wild Flowers as They Grow

There is also a point of literary interest about the Rock-Rose. When we look for the leaves on the shrubby branches we find them in pairs, small, oval, and slightly hairy. They are dark green above, whitish below, and have very short stalks. At the base of each leaf-stalk are two tiny leaves—stipules. Now while some species of Rock-Rose have these stipules, some have not, and the reason for this has often puzzled observers. Some time ago a French botanist pointed out that here was a case for research. Lord Avebury read this suggestion, and as no one seemed to have acted upon it, he took the matter up and began an investigation into this and cognate subjects. His research was published first by the Linnæan Society, and is now embodied in that classic on the matter “On Buds and Stipules.” About the Rock-Roses he says, “On examining the various species of the genus, I found that where the leaves have broad bases and thus protect the bud in their axil, there are no stipules; while, on the other hand, where the leaves are narrow, the

The Rock-Rose

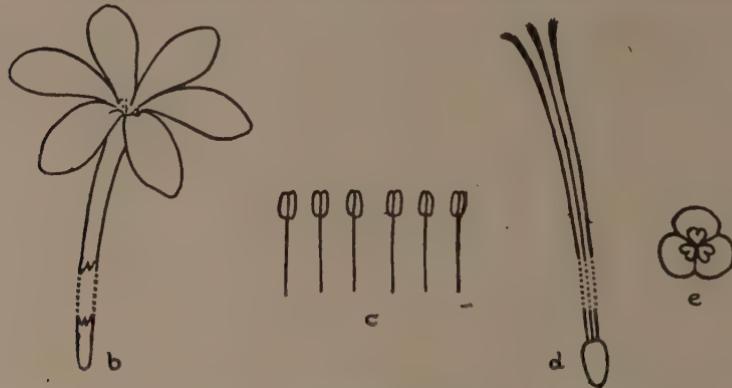
bud is protected by stipules." In the Rock-Rose of our picture the stipules stand like sentinels on either side guarding the bud.

Three other species of *Helianthemums* grow wild in Great Britain: the spotted rockcist (*H. guttatum*), often with a dark spot on its yellow petals, the hoary rockcist (*H. canum*), with small yellow flowers, and the white rockcist (*H. polifolium*), with white flowers. All three are rare and only found in a few localities.

THE MEADOW SAFFRON

COLCHICUM AUTUMNALE

THE Meadow Saffron is an eccentric of the plant world. Its character seems to be to act clean contrary to all preconceived ideas of plant



b, petals. c, stamens. d, stigmas, styles, ovary. e, seeds in fruit.

behaviour. It begins to flower just when other plants have fruited and are making preparations for their winter rest; and when they are putting forth their flower-buds in the spring, that is the



MEADOW SAFFRON

The Meadow Saffron

precise moment that it chooses to mature its seeds. With most plants it is a case of the leaves coming first and the flowers quickly following, both flourishing together in beauty and harmony; some few, like the coltsfoot, and, of course, many trees, produce their flowers before their leaves, but the Meadow Saffron chooses a way of its own, and its leaves have their day and completely vanish long before its flowers are thought of. It is a little difficult to know at what point of its life it may be said to "begin." Perhaps it is best to take the appearance of its brilliant, bare-looking flowers in the autumn as the starting point for our discussion.

In late September or October days the grass in the damp meadows, where this plant flourishes, becomes studded over with bright, crocus-like, purple flowers. Each is quite isolated and without enwrapping foliage, so that the country children call them "Naked Ladies" or "Naked Boys," or sometimes "Star-naked Boys," while "Upstart" is another appropriate countryside name for the flower. Each

Wild Flowers as They Grow

has just a single ring of purple petals (there is no green calyx) spreading in six segments, cup-like at top and continuing downwards as a very fine white or pale purple tube some four inches long, which looks as if it were really a delicate flower-stalk. If this be traced downwards into the earth and the whole plant then lifted, it is found to end in a sheath of brown scales which, in their turn, are the top of a bulb—in botanical parlance, a corm. This bulb is about the size of a chestnut, and its structure is somewhat complicated. One side is very rounded ; the other is flat, and has a deep furrow running down it. In this furrow the axis of the plant runs, on which is borne the scale leaves, the flowers, and the leaf-buds, while the central basal part is slightly swollen and will eventually increase into a corm for next year. The axis ends in a number of rootlets which run still farther into the ground. Thus, at the time of flowering, the suppressed stem of the plant is attached to the side of the corm from which it is drawing the nutriment

The Meadow Saffron

necessary to produce the flower. The corm is covered with brown, protective scales.

If we open the fragile flower and slit the long tube, we find six stamens attached to its upper part. They have long filaments on which the anthers are set see-sawing and facing outwards. Just where they are attached is a little orange-coloured honey-sac, and the honey issuing from it runs in a channel sheltered by hairs across the adjoining petal. In the centre of the corolla and quite free from its tube are three long columns or styles, which stand on the little ovary that is far away on the very bottom of the tube below the ground. It is the number of its stamens and its styles that separates this flower from the crocus which it so much resembles, but which has only three stamens and one style. The Meadow Saffron, therefore, is in the family *Liliaceæ*, while the crocus is of the family *Irideæ*. Now its styles differ definitely in length in different plants, and we have long-styled, mid-styled, and short-styled flowers all growing side by side in the same

Wild Flowers as They Grow

meadow; therefore, the plant's scheme for its fertilisation is an elaborate one, and rendered still more intricate because, during the time of flowering, the lower part of the petal segments grows, and hence the height of the anthers is perpetually being raised. Briefly, what happens is as follows.

When the flower first opens, the tops of the styles are above the stamens, and bees approaching with pollen on their bodies are bound to rub and fertilise them. Now the Meadow Saffron closes up tightly about six o'clock at night, and then the see-sawing pollen-boxes, which have opened outwards, rub on the petal-tube and smear it with honey. Next morning about nine o'clock the flower opens again, but this time the stamens and the stigmas are on the same level, for, though all the parts of the flower are still lengthening, the petals outstrip the others in the race. Three of the petals were originally shorter than the rest, and these grow fastest of all. If one examines carefully the relative length of the petals in young and old flowers growing together

The Meadow Saffron

in a meadow, one is surprised at the amount the petals grow. Kerner carefully measured the petal growth of over five hundred of these flowers. In long-styled flowers the shorter petals grew 12.6 mm. ; in short-styled flowers the shorter petals grew 15 mm. ; in mid-styled flowers the shorter petals grew 18.5 mm. ; and the longer petals grew from 3 mm. to 5 mm. less.

Anyway, the net result is that when the flower closes at night, the pollen-smear on the perianth ultimately reaches the level of the stigmas, and they, as the end of blooming comes, bend outwards and rub on the smeared place. Thus, the plant which began with aiming at cross-fertilisation, finishes by ensuring self-fertilisation, to supplement a possible miss of the first named. Humble bees are the flower's chief visitors, and to reach the honey they have to get right into the flower and thus touch both stigmas and anthers. The subtleties introduced by the styles being of varying length are too complicated to go into at length here.

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The tubes from the pollen grains have a long path to traverse to the underground ovary, but they arrive there at length and fertilise the seeds in each of the three chambers, and all through the winter the seed-capsule remains in the ground sheltered from the extreme severity of winter weather. The flower withers with the completion of pollination and disappears, leaving, of course, no trace of fruit behind it, which fact has been a mystery to many observers.

With the next spring-time, changes begin below ground ; the old corm, exhausted by the effort of flowering, disappears ; the new one, budded off at its base, swells and grows upwards, so that leaf-buds and fruits rise above ground, and soon we have the curious spectacle of a number of long, narrow leaves, very like those of a hyacinth, growing up in a green bunch from the earth and surrounding dry seed-capsules. In the spring sunshine the three-celled capsules split at top into three, and the seeds are shaken out. The leaves speed with the manufacturing of foodstuffs, and the corm below

The Meadow Saffron

ground swells more and more as the reserve is put away in it. The work is completed in early summer days, and then the leaves wither and completely disappear. In the meantime the new corm has formed, low down at its side, a tiny bud, and this, in the autumn, will produce first flowers and then the new corm for the following year. Thus, from autumn to autumn, is the life cycle of the Meadow Saffron completed.

This plant furnishes one of the most esteemed medical drugs of to-day—colchicum. It is, indeed, the hope of the gouty man, and is said to be almost a specific in an acute attack of gout. Baron Störch, of Vienna, first brought it into repute with modern physicians towards the end of the eighteenth century, and it has an honoured place in our present pharmacopœia. It is extracted both from the corm and the seeds. Only the fresh corm just stored by the leaves should be used, and this is gathered at the end of June, stripped of its coat, sliced, and dried. When fresh it is white and fleshy, and filled with a

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milky juice ; when dried it is ash-grey. Its taste is bitter and acrid. The celebrated gout mixture of the eighteenth century—*Eau medicinale*—was largely extracted from this plant. Wine of *colchicum*, also a well-known remedy, is made by macerating the dried corm in sherry—4 oz. of corm to 20 fluid oz. of sherry. In 1820 the seeds were introduced into medical practice. It is claimed that they are more certain in their action than the corm.

The plant is injurious to grazing animals, and an overdose of the drug is liable to be fatal to man.

The Latin name, *Colchicum*, is due to a Greek legend that in the fields of Colchis—a country east of the Black Sea—Medea, the daughter of the king, prepared a magic liquid for Jason, whom she loved, and that some drops of it fell to earth and gave birth to this flower.

In England it is often called “Autumn”—“Fog”—“Meadow”—“Michaelmas”—or “Purple Crocus.”

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